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## **CUMULATIVE**

Index
to
NASA Tech Briefs

January-December 1968



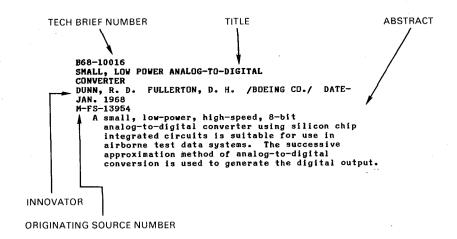
February 1969

National Aeronautics and Space Administration

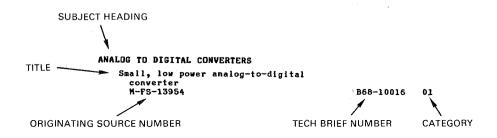
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## Introduction

This Index to NASA Tech Briefs lists the technological innovations derived from the U.S. space program and published during the period January through December 1968. A new five year cycle of cumulative indexes begins with this index. The Cumulative Indexes for the previous five years (1963–1967) are contained in NASA SP-5021(06) which was published in April 1968. The main section is arranged in six categories: Electrical (Electronic); Physical Sciences (Energy Sources); Materials (Chemistry); Life Sciences; Mechanical; and Computer Programs. A typical entry has these elements:



To help users locate information of value, three indexes are provided. The first is a subject index, arranged alphabetically:



Note that in this index several routes are opened for obtaining further information. If the title seems promising, the Tech Brief number and category may be used to locate the abstract, which will be found in the main section arranged sequentially by Tech Brief number within each category. Further, the Tech Brief number can of course be used for obtaining a copy of the original Tech Brief.

The second index relates all items by the originating source and number to the Tech Brief number and category.



The third index relates all items by the Tech Brief number and category to the originating source and number.

B68-10016\*# 01 M-FS-13954

TECH BRIEF NUMBER CATEGORY ORIGINATING SOURCE NUMBER

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# TECHNOLOGY UTILIZATION DIVISION NATIONAL AERONAUTICS AND SPACE ADMINISTRATION Washington, D.C. 20546

This *Index* supplements the *Cumulative Index* to *NASA Tech Briefs* (NASA SP-502(06)) which was published in April 1968. The index was prepared by the Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by the Technical Information Services Company.

### **TABLE OF CONTENTS**

Category	01	Electrical (Electronic)	1
Category	02	Physical Sciences (Energy Sources)	14
Category	03	Materials (Chemistry)	19
Category	04	Life Sciences	26
Category	05	Mechanical	27
Category	06	Computer Programs	35
Subject Ir	idex .	· · · · · · · · · · · · · · · · · · ·	I-1
Originato	r/Tec	h Brief Number Index	I-105
Tech Brie	f/Orio	ginator Number Index	I-109

#### 01 ELECTRICAL (ELECTRONIC)

B68-10001 DC PIN-TO-PIN TESTING OF INTEGRATED CIRCUITS THOMAS, E. F. DATE- JAN. 1968 GSFC-10284 External pin-to-pin nondestructive testing procedure measures the electrical characteristics of each element in an integrated circuit. The procedure involves choosing specific pairs of pins and applying appropriate test voltages to them. B68-10002 GAGE MONITORS QUALITY OF CROSS-WIRE RESISTANCE WELDS ETZEL, J. PILTCH, A. DATE- JAN. 1968 GSFC-90549 Gage nondestructively monitors the quality of cross-wire resistance welds during the welding operation. The gage gives a dial indication of the relative embedment of the cross wires during the actual welding operation. A direct relationship exists between the depth of embedment and both weld strength and consistency. LINEAR ANALOG DC VOLTAGE-TO-PULSE-WIDTH CONVERTER CROCKET, W. R. DATE- JAN. 1968 GSFC-556 Circuit converts a dc analog input signal to pulse widths that are proportional to the input signal woltage. The circuit would be particularly useful as an analog-to-digital converter where low power, ruggedness, reliability, and good linearity are prime requirements. B68-10007 BIMETAL SENSOR AVERAGES TEMPERATURE OF NONUNIFORM PROFILE DITTRICH, R. T. DATE- JAN. 1968 LEWIS-10362 Instrument that measures an average temperature across a nonuniform temperature profile under steady-state conditions has been developed. The principle of operation is an application of the expansion of a solid material caused by a change in temperature. B68-10008 IMPROVED PHASE LOCKED LOOP RECEIVER DALEY, T. J. /GEN. DYN./ELECTRON./ DATE- JAN. GSFC-09561 Improved phase locked loop receiver tracks and demodulates a signal whose signal-to-noise ratio may be low and whose information sidebands are close in frequency. This receiver recovers the carrier from input signals and applies it to a demodulator which recovers the sidebands. B68-10012 ONE-SHOT PULSE SHAPER CIRCUIT RADYS, R. G. /HUGHES AIRCRAFT CO./ DATE- JAN. 1968 XGS-11379 Pulse shaper circuit exhibits low power dissipation, self setting, and easy triggering. It is basically a magnetic one-shot multivibrator consisting of two blocking oscillators and an inhibit circuit. B68-10015 INPUT GATE CIRCUIT CONVERTED FOR USE AS LINEAR AMPLIFIER HARPER, T. P. /IBM/ DATE- JAN. 1968

Commercially available integrated circuit that is

ommercially available integrated circuit that is marketed as a digital computer input gate circuit was converted to a linear amplifier in a microphone circuit that has high input impedance, low cost, and is small enough to fit on a standard printed circuit card.

M-FS-14265

B68-10016 SMALL, LOW POWER ANALOG-TO-DIGITAL CONVERTER DUNN, R. D. FULLERTON, D. H. /BOEING CO./ DATE-JAN. 1968 M-FS-13954 A small, low-power, high-speed, 8-bit analog-to-digital converter using silicon chip integrated circuits is suitable for use in airborne test data systems. The successive approximation method of analog-to-digital conversion is used to generate the digital output. B68-10017 REGULATED DC-TO-DC CONVERTER FEATURES LOW POWER DRAIN THORNWALL, J. DATE- JAN. 1968 GSFC-03429 A regulated dc-to-dc converter requires negligible standby power for the operation of critical electronic equipment. The main operating circuitry consumes power intermittently according to load conditions, rather than constantly. B68-10018 DIGITAL DATA AVERAGER IMPROVES CONVENTIONAL MEASUREMENT SYSTEM PERFORMANCE NAYLOR, T. K. ROBERTS, J. A., JR. SCHELLENBACH, R. R. /RCA/ DATE- FEB. 1968
MSC-12078 Multipurpose digital averager provides measurement improvement in noisy signal environments. It provides increased measurement accuracy and resolution to basic instrumentation devices by an arithmetical process in real time. It is used with standard conventional measurement equipment and digital data printers. B68-10019 CIRCUIT DETECTS VOLTAGE DECREASE IN COMPUTER POWER SUPPLY HOUCK, W. H. DATE- FEB. 1968 KSC-67-120 :-67-120
Rapid-response monitoring circuit detects voltage decrease or dropout in any single phase or all three phases simultaneously of a 3-phase 60 Hz computer power supply. It uses lamps to indicate voltage conditions and provides a digital pulse output for a chronological record of voltage irregularities. B68-10027 ANALYSIS OF FLUTTER IN TAPE TRANSPORT SYSTEMS DAVIS, R. C. SIMPSON, R. S. /ALABAMA UNIV./ DATE- JAN. 1968 M-FS-11970 Effect of flutter on digital data is recorded by magnetic tape recorders used with instrumentation systems. Major effect for both FM and direct recording techniques is shown to be a perturbation of the signal time base. ELECTRONIC APERTURE CONTROL DEVISED FOR SOLID STATE IMAGING SYSTEM
ANDERS, R. A. CALLAHAN, D. E. MC CANN, D. H.
/WESTINGHOUSE ELEC. CORP./ DATE- FEB. 1968 . M-FS-12428 Electronic means of performing the equivalent of automatic aperture control has been devised for the new class of television cameras that incorporates a solid state imaging device in the form of phototransistor mosaic sensors. B68-10030 FLARE ANGLES MEASURED WITH BALL GAGE CLEGHORN, D. WALL, W. A. DATE- MAY 1968 M-FS-14690 Precision tungsten carbide balls measure the internal angle of flared joints. Measurements from small and large balls in the flare throat to an external reference point are made. The difference in distances and diameters determine the average slope of the flare between the points of ball contact.

THIN FILM HEAT TRANSFER GAGE IS STABLE

AT HIGHER TEMPERATURES DATE- MAR. 1968 SEE ALSO B66-10180 M-FS-12396

78-12396

Thin film convective heat transfer gage functions effectively for prolonged periods at temperatures up to 1000 degrees F. An initial resistance shift does not inhibit the performance or accuracy of the gages, as the original resistance-temperature relationship remains unchanged.

AMPLITUDE AND FREQUENCY READOUT OVERLAY FITCH, A. E. DATE- MAR. 1968 GSFC-10183

Amplitude and frequency readout overlay simplifies the interpretation of oscillograph traces for full scale deflections of one inch. The overlay increases accuracy in data interpretation and saves time in analyzing oscillograph records.

B68-10056 LUMINESCENT SCREEN COMPOSITION FOR CATHODE RAY TUBES HILBORN, E. H. DATE- MAR. 1968

Screen composition for cathode ray tubes exhibits differential color of emission as a function of beam current variation at a constant accelerating voltage. The screen consists of a mixture of phosphors which emit different hues, have different current saturation values and exhibit a nonlinear current-brightness characteristic.

B68-10058 SIMPLIFIED, HIGH-SPEED BINARY DATA DECODER ANDERSON, T. O. DATE- FEB. 1968 NPO-10118

Simplified, high-speed decoder of encoded binary data received over a noisy channel is provided in a versatile apparatus that can accommodate more than one particular set of codes. The apparatus is applicable to satellite, lunar, and planetary data transmission.

THERMAL SHORT IMPROVES SENSITIVITY OF CRYOGENICALLY COOLED MASER CLAUSS, R. C. DATE- MAR. 1968 CLAUSS, R. C. NPO-09975

J-0975
In-line, quarter-wave thermal short cools the center conductor of the signal-input coaxial transmission line to a cryogenically cooled traveling wave maser. It reduces both the thermal noise contribution of the coaxial line and the heat leak through the center conductor to the maser at 4.4 degrees K.

B68-10061 ELECTRONIC CIRCUIT PROVIDES AUTOMATIC LEVEL CONTROL FOR LIQUID NITROGEN TRAPS TURVY, R. R. DATE- MAR. 1968 KSC-10127

Electronic circuit, based on the principle of increased thermistor resistance corresponding to decreases in temperature provides an automatic level control for liquid nitrogen cold traps. The electronically controlled apparatus is practically service-free, requiring only occasional reliability checks.

B68-10063 PLASTIC PREFORMS FACILITATE FABRICATION OF WELDED CORDWOOD ELECTRONIC MODULES STURMAN, J. C. DATE- MAR. 1968 LEWIS-90339

Molded plastic preform facilitates the fabrication of small lots of welded cordwood circuits. The preforms retain the components during welding and electrical checkout and facilitate encapsulation of the welded module when used with a conventional potting shell.

MULTICHANNEL IMPLANTABLE TELEMETRY SYSTEM FRYER, T. B. DATE- MAR. 1968 SEE ALSO B64-10171, B66-10057, AND B66-10624

ARC-10083

Multichannel telemetry system is used for chronic implantation in animals to monitor a variety of physiological parameters. A hermetically sealed unit, the system uses a time-sharing multiplex scheme to commutate between various sensor inputs and enables the number of channels to be increased or decreased.

SELF-CORRECTING, SYNCHRONIZING RING COUNTER USING INTEGRATED CIRCUIT DEVICES MAASBERG, W. A. /IBM/ DATE- MAY 1968

M-FS-13901

Three nand gate circuits are used to add error detection and reset logic circuitry for initiating and retaining the correct binary state in the flip-flop circuits of a ring counter. As the input signals are counted, the position of the specified state moves in ordered sequence around circuit loop.

B68-10068 DIVERSITY RF RECEIVING SYSTEM WITH IMPROVED PHASE-LOCK CHARACTERISTICS
DI LOSA, V. J. LAUGHLIN, C. R., JR. DATE- MAR. XGS-01222

Improved diversity receiving system automatically utilizes the combined output from its two independent receiving channels /with cross polarized receiving antennas/ to increase the reliability of maintaining the requisite phase lock for optimum signal reception. It is adapted for use with AM, PM, or narrow band FM signals.

B68-10069 PRINCIPLES OF OPTICAL-DATA PROCESSING **TECHNIQUES** SHULMAN, A. R. DATE- MAR. 1968 GSFC-10271

Document presents optical-data processing information on a level which will convey the basic principles involved to those having a general technical background. Mathematical discussions are included but are not required for a basic understanding.

B68-10070
DEVELOPMENT OF BIAXIAL TEST FIXTURE
INCLUDES CRYOGENIC APPLICATION
HELF, J. C. KELLY, R. E. KERR, D. A. WALDRON,
C. R. /N. AM. AVIATION/ DATE- APR. 1968
M-FS-14185 M-FS-14189
Test fixture has the capability of producing
biaxial stress fields in test specimens to the
point of failure. It determines biaxial stress
by dividing the applied load by the net cross
section. With modification it can evaluate
materials. desion concepts, and production B68-10070

materials, design concepts, and production hardware at cryogenic temperatures.

NEW MICROELECTRONIC POWER AMPLIFIER
NEW, T. C. /WESTINGHOUSE ELEC. CORP./ DATE- MAR.
1968 M-FS-13621

Integrated push-pull power amplifier fabricated on a chip of silicon has interdigitated power transistors and is hermetically encapsulated in a beryllia flat package. It provides current output greater than the nominal 10 amperes from an input current drive of 1 ampere.

IMPROVED DC VOLTAGE MULTIPLIER SAVELLE, C. R., JR. /SPACO/ DATE- MAR. 1968 M-FS-14042

FS-14042
Circuit multiplies a dc input voltage in the millivolt range to yield a larger dc output voltage bearing a fixed ratio to the input voltage. The supply voltage need not be precisely regulated, the potentiometer need not be linear, and the gain of servo amplifier is not critical.

B68-10079 MAGNETIC TAPE TRANSPORT CONTROLLED BY ROTATING TRANSDUCER HEADS CHUPITY, J. SALCEDO, G. SPERRY, J. D. /AMPEX CORP./ DATE- MAR. 1968 GSFC-483

Magnetic tape transport includes a common drive for both the tape drive capstans and the rotating record/reproduce heads. Speed of the drive may be varied within a preselected range, but, once selected, remains constant so head and capstan are driven in synchronization and at constant speed.

B68-10083
TWIN SOLUTION CALORIMETER DETERMINES
HEATS OF FORMATION OF ALLOYS AT HIGH
TEMPERATURES

DARBY, J. B., JR. KLEB, R. KLEPPA, O. J. /CHICAGO UNIV./ DATE- APR. 1968 ARG-10114

Calvert-type, twin liquid metal solution
calorimeter determines the heats of formation of
transition metal alloys at high temperatures.
The twin differential calorimeter measures the
small heat effects generated over extended periods
of time, has maximum operating temperature of 1073
degrees K and an automatic data recording system.

B68-10084
GYRATOR-TYPE CIRCUITS REPLACE UNGROUNDED INDUCTORS
DEBOO, G. J. DATE- MAR. 1968
XAC-10608

Gyrator circuits using only transistors, capacitors, and resistors which can replace both grounded and ungrounded inductors have been developed to permit complete microminiaturization of circuitry by integration of the components.

B68-10086
METHOD OF DISJOINING ADHESIVELY BONDED
ELECTRONIC CORDWOOD MODULES
SACRAMONE, P. J. /RCA/ DATE- MAY 1968
MSC-12060

Embedment of resistive heating elements in a cordwood module used for packaging electronic components, facilitates separation of the adhesive bond between the module, and metal heat sink and the potting material without damaging the components. Electrical power applied to the elements causes breakdown of bonding material.

B68-10087
SUPERCONDUCTING SWITCH PERMITS MEASUREMENT
OF SMALL VOLTAGES AT CRYOGENIC TEMPERATURES
GOVEDNIK, R. E. HUEBENER, R. P. DATE- APR. 1968
ARG-90260

Dual-coil, superconducting, on-off switch measures small, thermoelectrically generated voltages produced by thermocouples in a liquid helium bath. Placed in a shunt configuration between the thermocouple and the measuring device, the measuring device sees the sum of the voltage to be measured and the spurious thermoelectric voltages.

B68-10088
NEW CAMERA TUBE IMPROVES ULTRASONIC
INSPECTION SYSTEM
BERGER, H. COLLIS, W. J. JACOBS, J. E.
//NORTHWESTERN UNIV./ DATE- APR. 1968
ARG-90237

Electron multiplier, incorporated into the camera tube of an ultrasonic imaging system, improves resolution, effectively shields low level circuits, and provides a high level signal input to the television camera. It is effective for inspection of metallic materials for bonds, voids, and homogeneity.

B68-10089
MONITOR SENSES AMOUNT OF CONTAMINATION
DEPOSITED ON SURFACES
SHEEHY, R. N. DATE- MAR. 1968
GSFC-10212

Monitoring device detects and indicates directly the amount of contamination deposited on a surface. It uses an optical system in conjunction with a reliable collimated light source and associated electronics. Change in its output signal is proportional to change in the optical absorption characteristics of the sample plate surface.

B68-10091 AUTOMATIC CONTOUR WELDER INCORPORATES SPEED CONTOUL SYSTEM WALL, W. A., JR. DATE- MAR. 1968 M-FS-14574

Speed control system maintains the welding torch of an automatic welder at a substantially constant speed. The system is particularly useful when welding contoured or unusually shaped surfaces, which cause the distance from the work surface to the weld carriage to vary in a random manner.

B68-10093
ACCUMULATOR FOR SHAFT ENCODER
CARROLL, C. C. CHILDS, J. A. ROBISON, R. J.
/AUBURN UNIV./ DATE- MAR. 1968
M-FS-13599

Digital accumulator relies almost entirely on integrated circuitry to process the data derived from the outputs of gyro shaft encoder. After the read command is given, the output register collects and stores the data that are on the set output terminals of the up-down counters.

B68-10100
ALTERNATING CURRENT ELECTROMAGNETIC SERVO INDUCTION METER
BOGUE, R. K. DATE- MAY 1968
XFR-03838

Electromagnetic device accurately indicates the responses of various sensors in high performance flight research aircraft to conditions encountered in flight. The device responds to sensor inputs to move a slideable armature along an indicator scale by the force of currents induced in the armature winding.

B68-10106
PORTABLE PULSE CODE MODULATION /PCM/
SUBSYSTEM
BRADANINI, P. A. KLUTH, J. T. /N. AM. AVIATION/
DATE- MAR. 1968
MSC-11369

Small, programmable, high speed PCM subsystem, supports the variety of signals inherent in sophisticated equipment. A signal generated by a transducer is first conditioned to the proper signal range, then sampled by an external multiplexer or by the subsystem directly and then converted and transmitted to a receiving station.

B68-10112
PROJECTION TRANSPARENCIES FROM PRINTED
MATERIAL
GRUNEWALD, L. S. NICKERSON, T. B. /BOEING CO./
DATE- APR. 1968
M-FS-14608

Method for preparing project transparencies, or view graphs, permits the use of almost any expendable printed material, pictures, charts, or text, in unlimited color or black and white. The method can be accomplished by either of two techniques, with a slight difference in materials.

B68-10114
PIGGY-BACK MOUNTING WOULD INCREASE
MICROCIRCUIT PACKAGING DENSITY
GAUDIANO, S. DATE- APR. 1968
MSC-12059

Piggy-back method of packaging integrated circuits will increase packaging density and design flexibility. It will also eliminate interconnection leads between the die and associated inductances, and thus increase the attainable frequency response of the circuit.

B68-10116
HIGH EFFICIENCY, HIGH FREQUENCY MAGNETIC
DEFLECTION DRIVER
SCHAFF, F. L. /WESTINGHOUSE ELEC. CORP./ DATEAPR. 1968
MSC-11597

Electromagnetic deflection yoke stores energy during the scan and releases it in the flyback or retrace. The operation of the device involves a method of switching to a voltage high enough to dissipate the flyback pulse during the retrace time and then operating during the scan time at a much lower voltage.

B68-10118
BILATERAL, ZERO-IMPEDANCE STATIC
SEMICONDUCTOR SWITCH
DOUGHMAN, C. L. /WESTINGHOUSE ELEC. CORP./
DATE- APR. 1968
LEWIS-10129

Static semiconductor switching circuit eliminates the undesirable features of electromechanical relays and conventional semiconductor switching circuits. There is a net zero voltage drop at the terminals and thus a zero impedance for bilateral currents there.

B68-10121

CIRCUIT ENHANCES VERTICAL RESOLUTION IN
RASTER SCANNING SYSTEMS
ALSOVSKY, W. H. GREENWOOD, J. R. HOLLEY, O. M.
/PHILCO-FORD CORP./ DATE- APR. 1968
MSC-12123

Circuit enhances vertical resolution in electron beam, raster scanning systems exhibiting aperture distortion in the vertical direction. A sensitized area /image/ produces a video output when the scan beam nears it, which causes vertical elongation in the reconstructed images of all sensitized areas on the surface.

B68-10124
RELIABLE, SELF-CALIBRATING VIBRATION
TRANSDUCER
MC KINNEY, R. L. DATE- APR. 1968
LANGLEY-89

Transducer system measures the uniaxial vibration amplitudes /deflections/ and frequency of a body subjected to mechanical vibration. The basic system is self-calibrating and provides an output which unambiguously indicates the direction as well as the magnitude of the uniaxial deflections.

B68-10129
COMPENSATION CIRCUIT IMPROVES OPERATION OF INDUCTIVE COUPLING TRANSFORMERS
INNOVATOR NOT GIVEN /SPERRY GYROSCOPE CO./
DATE- APR. 1968
M-FS-13801

Circuitry eliminates undesirable modulation effects in rotary transformers which transfer electrical energy to and from angular rate transducers on a gyroscope. It cancels the error by feeding back compensation signals through a tertiary winding on the stator of the output rotary transformer.

B68-10130
PHASE-LOCK LOOP FREQUENCY CONTROL AND THE
DROPOUT PROBLEM
ATTWOOD, S. KLINE, A. J. /MOTOROLA/ DATE- APR.
1968
M-FS-13948 M-FS-13950

Technique automatically sets the frequency of narrow band phase-lock loops within automatic lock-in-range. It presets a phase-lock loop to a desired center frequency with a closed loop electronic frequency discriminator and holds the phase-lock loop to that center frequency until lock is achieved.

B68-10131
AUTOMATED PATIENT MONITORING SYSTEM
BEDARD, R. E. BUXTON, R. L. DAWSON, W. S.
/BOEING CO./ DATE- MAY 1968 SEE ALSO
B68-10065
B68-14552

Radio-linked patient monitoring system collects several channels of physiological data from as many as 64 hospital patients and transmits the data in digital form to a central control station. The system consists of a central control station and battery-operated patient units comprising small strap-on electronics packages.

B68-10133
IMPROVED COMPENSATION CIRCUIT FOR
DIRECT-COUPLED AMPLIFIERS
BREURER, D. R. /TRW SPACE TECHNOL. LABS./ DATEAPR. 1968
MSC-11148 MSC-11235
Drift- and offset-control circuit compensates the
inherent temperature drift and offset of a

closed-loop feedback amplifier. It overcomes the disadvantages of conventional chopping circuits used to minimize drift in low-level, direct-coupled amplifiers.

B68-10138
ELECTRONIC CALORIMETRIC COMPUTER
HECKELMAN, J. D. DATE- APR. 1968
LEWIS-90254

Electronic calorimetric computer calculates nuclear reactor thermal power output to a nominal accuracy of 1 percent. Heat balance is determined by an electronic approach. The thermal power is calculated using the inlet and outlet temperatures and the volume of cooling water and is displayed by a digital readout system.

B68-10140
INSTRUMENTATION FOR BONE DENSITY MEASUREMENT
MEHARG, L. S. /KAMAN INSTR./ DATE- APR. 1968
MSC-11388

Measurement system evaluates the integrated bone density over a specific cross section of bone. A digital computer converts stored bone scan data to equivalent aluminum calibration wedge thickness, and bone density is then integrated along the scan by using the trapezoidal approximation integration formula.

B68-10141 STERED PHOTOMACROGRAPHY SYSTEM LINDSEY, W. F. DATE- APR. 1968 LANGLEY-10176

Stereo photomacrography system provides sharply focused and correctly exposed stereo pairs of photographs through a stereomicroscope. The system uses components of the old system but incorporates a sharp focusing system and includes an improved photometer.

B68-10144
CARDIAC R-WAVE DETECTOR
GEBBEN, V. D. DATE- APR. 1968 SEE ALSO
NASA-TM-X-1489
LEWIS-10394

AIS-10394
Cardiac R-wave detector obtains the systolic contraction signal of the human heart and uses it as a reference signal for a heart-assist pump cycle. It processes the natural heart\*s electrocardiac signal /QRS wave complex/ in a sequence of operations which essentially eliminates all components from the input signal except the R-wave.

B68-10145
HIGH-PRESSURE GAS FACILITATES CALIBRATION OF
TURBINE FLOWMETERS FOR LIQUID HYDROGEN
KRAUSE, L. N. SZANISZLO, A. J. DATE- MAY 1968
SEE ALSO B67-10506 AND NASA-TN-D-3773
LEWIS-10402

Nitrogen gas at a pressure of 60 atmospheres and ambient temperature facilitates the calibration of turbine flowmeters used for monitoring the flow of liquid hydrogen in cryogenic systems. Full-scale calibration factors can be obtained to an accuracy of 0.4 percent.

B68-10147
DEFLECTION CIRCUIT MONITORS FORCE ON OBJECT
UNDER WATER
ROLLER, R. YAROSHUK, N. /WESTINGHOUSE ASTRONUCL.
LAB./ DATE- MAY 1968
NUC-10147

Capsule containing samples for radiation testing is guided under through a seal to an exact position within a nuclear reactor. A Linear Variable Differential Transformer /LVDT/ flexplate deflection circuit monitors the force on the capsule as it is positioned within the reactor.

B68-10148
SILICON SOLAR CELL MONITORS HIGH TEMPERATURE FURNACE OPERATION
ZELLNER, G. J. /WESTINGHOUSE ASTRONUCL. LAB./
DATE- MAY 1968
NUC-10163
Silicon solar cell, attached to each viewpoint,

4

monitors that incandescent emission from the hot interior of a furnace without interfering with the test assembly or optical pyrometry during the test. This technique can provide continuous indication of hot spots or provide warning of excessive temperatures in cooler regions.

B68-10149
SYSTEM REMOTELY INSPECTS, MEASURES, AND
RECORDS INTERNAL IRREGULARITIES IN PIPING
BURRY, F. H. CUNNINGHAM, J. Y. HEISMAN, R. M.
ICELAND, W. F. NORWOOD, L. B. /N. AM. AVIATION/
DATE- MAY 1968
M-FS-14545

Video electromechanical probe visually inspects and measures internal offset and peaking of welds in relatively large piping. Irregularity dimensions are recorded on peripheral equipment consisting of video tape and X-Y plotter. The probe is used for inspection of vacuum-jacketed liquid lines that cannot be inspected externally.

B68-10151
IMPROVED S/N METER
WINDETT, C. B. /MOTOROLA/ DATE- MAY 1968
MSC-11656

Signal-to-noise ratios /S/N/ meter containing a variable-frequency notch filter measures noise plus interference in the presence of carrier or modulation signals. A noise source and calibration signal source are included in the instrument for calibration purposes.

B68-10152
MM-WAVE POWER METER MOUNT
MULLEN, D. L. OLTMANS, D. A. STELZRIED, C. T.
DATE- MAY 1968
NPO-10348

E-band thermistor mount and a technique for adjusting a temperature compensating thermistor to provide an electrically balanced bridge are used for measuring RF power in the mm-wavelength. The mount is relatively insensitive to temperature effects that cause measurement errors in single ended circuits.

B68-10155
HYDRA 1 DATA DISPLAY SYSTEM
HODGKINS, R. L. OSGOOD, D. R. DATE- MAY 1968
MSC-11594

3-11594
System, named Hydra, generates charts, graphs, and printed matter on slides or conventional negatives and positives, and combines these media with a capability of storage on magnetic tape for future updating to accommodate engineering changes or contract modifications to be readily added to hasic data.

B68-10156
PRECISION BOLOMETER BRIDGE
WHITE, D. R. /N. AM. AVIATION/ DATE- MAY 1968
MSC-11473

Prototype precision bolometer calibration bridge is manually balanced device for indicating dc bias and balance with either dc or ac power. An external galvanometer is used with the bridge for null indication, and the circuitry monitors voltage and current simultaneously without adapters in testing 100 and 200 ohm thin film bolometers.

B68-10157
THERMAL RESISTANCES OF SOLDER-BOSS/POTTING
COMPOUND COMBINATIONS
VEILLEUX, E. D. /RCA/ DATE- MAY 1968
MSC-12074

Formulas, which can be used as a design tool, are derived to calculate the thermal resistance of solder-boss/potting compound combinations, for different depths of a solder boss, in electronic cordwood modules. Since the solder boss is the heat source, its shape and position will affect the thermal resistance of the surrounding potting compound.

B68-10163
IMPROVED PROCESS FOR MAKING THIN-FILM SODIUM
NIOBATE CAPACITORS
MICKA, E. Z. /TRW SPACE TECHNOL. LABS./ DATE-

MAY 1968 MSC-11231

C-11231
Sodium niobate, formed by high vacuum, flash, and reactive evaporations, has a high dielectric constant and is used as a thin film dielectric in microelectronic capacitors. High purity films are formed from relatively inexpensive, pure starting materials. Crystalline sodium niobate films can be formed on amorphous or crystalline materials.

B68-10166
SILICON SURFACE BARRIER DETECTORS USED FOR LIQUID HYDROGEN DENSITY MEASUREMENT JAMES, D. T. MILAM, J. K. WINSLETT, H. B./ORTEC CO./ DATE- JUN. 1968
M-FS-14115

Multichannel system employing a radioisotope radiation source, strontium-90, and a radiation detector, silicon surface barrier detector, measures the local density of liquid hydrogen, at various levels in a storage tank. The instrument contains electronic equipment for collecting the density information, and a data handling system for processing this information.

B68-10171
SILICON OXIDE FILMS GROWN IN MICROWAVE
DISCHARGE
KRAITCHMAN, J. /WESTINGHOUSE RES. LABS./ DATEJUN. 1968
M-FS-14634

Silicon oxide films thicker than 1000 angstrom are produced in the dense plasma of a microwave discharge. The oxide growth is characterized by a rate limiting diffusion process modified by sputtering effects produced by the discharge. Silicon is rapidly oxidized at temperatures estimated to be 500 degrees C or lower.

B68-10173
TUNNEL DIODE CIRCUIT USED AS
NANDSECOND-RANGE TIME MARKER
LARSEN, R. N. SHEAR, E. B. DATE- JUN. 1968
ARG-90164

Simple tunnel diode time marker circuit determines the time at which an event occurs in a scintillation crystal. It is capable of triggering at voltages as low as the noise level of a 10-stage PM tube.

B68-10175
CAPACITANCE-COUPLED WIPER INCREASES
POTENTIONETER LIFE
DIMEFF, J. DATE- JUN. 1968 SEE ALSO
NASA-TM-X-1235
ARC-10060

Capacitively-coupled wiper reduces the friction between the sliding contact and the potentiometer element in conventional potentiometers. A small preamplifier employed close to the wiper reduces errors caused by output cable capacitance. The device is friction free with resultant low wear and has high speed and high resolution.

B68-10182
STEADY-STATE DIFFERENTIAL CALORIMETER
MEASURES GAMMA HEATING IN REACTOR
HERBST, D. TALBOY, J. H. DATE- JUN. 1968
SEE ALSO ANL-7178
ARG-10120

Steady-state differential calorimeter, which displays good accuracy and reproducibility of results, is used to measure gamma heating in a reactor environment. The calorimeter has a long life expectancy since it is virtually unharmed by the reactor environment.

B68-10183
DETECTION AND LOCATION OF METALLIC OBJECTS
IMBEDDED IN NONMETALLIC STRUCTURES
BROWN, R. L. NEUSCHAEFER, R. W. DATE- JUN. 1968
M-FS-14790

Small battery operated eddy current proximity measuring device detects and locates metal objects the size of a dime at distances up to one foot within nonmetallic structures. This device weighs approximately two pounds, occupies approximately 60 cubic inches, and is battery

powered.

B68-10185
CONCEPT FOR SLEEVE INDUCTION MOTOR WITH
1-MSEC MECHANICAL TIME CONSTANT
WIEGAND, D. E. DATE- JUN. 1968
ARG-10124

Conductive sleeve induction motor having a 1-msec mechanical time constant is used with solid-state devices to control all-electric servo power systems. The servomotor rotor inertia is small compared to the maximum force rating of the servo motion, permitting high no-load acceleration.

B68-10188
HIGH- AND LOW-PRESSURE PNEUMOTACHOMETERS
MEASURE RESPIRATION RATES ACCURATELY IN
ADVERSE ENVIRONMENTS
FAGOT, R. J. MC DONALD, R. T. /NORTHROP
NORTRONICS/ ROMAN, J. A. DATE- JUN. 1968
SEE ALSO NASA-TN-D-4217
FRC-10012 FRC-10022

Respiration-rate transducers in the form of pneumotachometers measure respiration rates of pilots operating high performance research aircraft. In each low pressure or high pressure oxygen system a sensor is placed in series with the pilots oxygen supply line to detect gas flow accompanying respiration.

B68-10202
FAST-RESPONSE CUP ANEMOMETER FEATURES
COSINE RESPONSE
FRENZEN, P. DATE- JUN. 1968 SEE ALSO
ANL-7360
ANG-90193

Six-cup, low-inertia anemometer combines high resolution and fast response with a unique ability to sense only the horizontal component of the winds fluctuating rapidly in three dimensions. Cup assemblies are fabricated of expanded polystyrene plastic.

B68-10203
ELECTRONIC LOAD FOR TESTING POWER
GENERATING DEVICES
FRIEDMAN, E. B. STEPFER, G. DATE- JUN. 1968
NPO-10350

Instrument tests various electric power generating devices by connecting the devices to the input of the load and comparing their outputs with a reference voltage. The load automatically adjusts until voltage output of the power generating device matches the reference.

B68-10205 MULTILAYER PLATED WIRE SHOWS PROMISE AS MEMORY DEVICE KADISH, D. /MIT/ DATE- JUN. 1968 MSC-11587

Multilayer plated wire memory system surpasses planar thin film memories because of its high speed, simplicity, and high output. The device consists of 5 mil Be-Cu wire plated with Ni-Fe alloy about 1 micron thick crossed orthogonally by word lines.

B68-10207 FACSIMILE VIDEO ENHANCEMENT DEVICE VERMILLION, C. H. DATE- JUN. 1968 GSFC-10185

Video remodulation unit enhances facsimile transmission using an amplitude-modulated 2400 Hz carrier. The unit demodulates the signal and then remodulates it, using the same carrier. By using the unit controls, modulation can be set to levels that compensate for picture in-transit degradation.

B68-10210
ACTIVE RC NETWORKS OF LOW SENSITIVITY FOR
INTEGRATED CIRCUIT TRANSFER FUNCTION SYNTHESIS
HUELSMAN, L. P. KERWIN, W. J. NEWCOMB, R. W.
DATE- JUN. 1968
ARC-10146

Active RC network is capable of extremely high Q performance with exceptional stability and has independently adjustable zeros and poles. The circuit consists of two integrators and two summers that are interconnected to produce a complete second-order numerator and a second-order denominator.

B68-10213
TECHNIQUE INCREASES STORAGE CAPACITY IN
CAMERA TUBE TARGET
BOLL, K. F. DE VRIES, H. R. /WESTINGHOUSE ELEC.
CORP./ DATE- JUN. 1968
MSC-11599

Technique increases the signal current, where direct beam readout is used, in Secondary Electron Conduction /SEC/ camera tubes. Increasing the storage capacity and therefore the dynamic range of the SEC target permits satisfactory operation at reduced frame rates.

B68-10218 ZINC-DXYGEN PRIMARY CELL YIELDS HIGH ENERGY DENSITY GRAFF, C. B. DATE- JUN. 1968 M-FS-14661

Zinc-oxygen primary cell yields high energy density for battery used as an auxiliary power source in space vehicle systems. Maximum reliability and minimum battery weight is achieved by using a stacking configuration of 23 series-connected modules with 6 parallel-connected cells per module.

B68-10220
NEW ELECTRICAL PLETHYSMOGRAPH MONITORS
CARDIAC DUTPUT
KUBICEK, W. B. PATTERSON, R. P. WITSDE, D. A.
//MINNESOTA UNIV./ DATE- JUN. 1968
MSC-11447

Four-electrode impedance plethysmograph measures ventricular stroke volume of cardiac output of humans. The instrument is automatic, operates with only one recording channel, and minimizes patient discomfort.

B68-10223 LIGHTWEIGHT HEATER GENERATES HIGH TEMPERATURES FROM LOW CURRENT HANSEN, E. L. DATE- JUL. 1968

N-10004

Double spiral molybdenum heater element uses low current, needs no insulation, and requires support only at the ends, which are also the power input points. Because there is no insulation or internal support necessary, the heater is lightweight. Its temperature potential will vary with its size and environment.

B68-10224 SEMICONDUCTOR AC STATIC POWER SWITCH VRANCIK, J. DATE- JUN. 1968 LEWIS-10344

Semiconductor ac static power switch has long life and high reliability, contains no moving parts, and operates satisfactorily in severe environments, including high vibration and shock conditions. Due to their resistance to shock and vibration, static switches are used where accidental switching caused by mechanical vibration or shock cannot be tolerated.

B68-10230
IMPROVED ATOMIC RESONANCE GAS CELL FOR USE
IN FREQUENCY STANDARDS
HUGGETT, G. R. /VARIAN ASSOCIATES/ DATE- JUL.
1968
MSC-11666

Atomic resonance gas cell maintains a stable operating frequency in the presence of pressure fluctuations in the ambient atmosphere. The new cell includes an envelope which is transparent to radiation in the optical region and to microwave energy at the atomic resonance frequency of the alkali-metal vapor within the envelope.

B68-10233
ELECTROCARDIOGRAPH TRANSMITTED BY RF AND
TELEPHONE LINKS IN EMERGENCY SITUATIONS
CARPENTER, L. R. LEWIS, C. E., JR. MC DONALD, R.
T. DATE- JUL. 1968
FRC-10031

Electrocardiograph of an injured human subject is

transmitted by RF and telephone links from the ambulance at the emergency scene, to the hospital emergency facilities. This system eliminates delay in the diagnosis of required therapy, thereby enhancing emergency and rescue operations.

B68-10236
QUASI-STATIC VAPOR PRESSURE MEASUREMENTS
ON REACTIVE SYSTEMS IN INERT ATMOSPHERE BOX
FISCHER, A. K. DATE- JUL. 1968
ARG-90142

Apparatus makes vapor pressure measurements on air-sensitive systems in an inert atmosphere glove box. Once the apparatus is loaded with the sample and all connections made, all measuring operations may be performed outside the box. The apparatus is a single-tube adaptation of the double-tube quasi-static technique.

B68-10238
ASTRONAUT SPACE SUIT COMMUNICATION ANTENNA
LINDSEY, J. F., III NASON, G. H. DATE- JUL. 1968
MSC-12101

Astronaut space suit communication antenna consists of a spring steel monopole in a blade-type configuration. This antenna is mounted in a copper cup filled with a potting compound that is recessed in the center to facilitate bending the blade flat for stowing when not in use.

B68-10241
PARALLEL-TO-SERIAL BIPHASE-DATA CONVERTER
TRUELOVE, R. D. /N. AM. AVIATION/ DATE- JUL.
1968
MSC-11600

Data converter produces a serial biphase output signal from parallel input data. Alternate bits are loaded into a shift register in complement form so that the bits appear at the end of the shift register in a true-complement form sequence.

B68-10242
WELDER ANALYZER
MILLER, L. L. /GEN. MOTORS CORP./ DATE- JUL.
1968
MSC-12068

J-12068
Welder analyzer circuit evaluates and certifies resistance welding machines. The analyzer measures peak current, peak voltage, peak power, total energy, and first-pulse energy. It is used as an energy monitor while welding is being performed, or a precision shunt load for a pure electrical evaluation of the weld machine.

B68-10244
IMPROVED TRAVELING WAVE MASER AMPLIFIER
CLAUSS, R. C. DATE- JUL. 1968
NPO-10548

Traveling Wave Maser /TWM/ that operates at S-band frequencies is characterized by a greatly improved gain-bandwidth product with relatively low equivalent-noise temperature. Tests indicate that its performance exceeds that of any other type of S-band amplifier.

MEMBER APPLICATION
WALKER, R. R. WICKHAM, C. G. /N. AM. AVIATION/
DATE- JUL. 1968
MSC-11869

MSC-11869
Miniature pressure transducer responds to static or dynamic pressures acting against a structural surface without introducing errors caused by stresses in the structural surface. This is accomplished by a thin stainless steel pressure sensing diaphragm with an attached foil strain gage.

HARMONIC DISTORTION ANALYZER SPEEDS SETUP OF MAGNETIC TAPE RECORDERS
TINARI, D. F. DATE- JUL. 1968
GSFC-10198

Harmonic distortion analyzer effects rapid and accurate setup and calibration of magnetic tape instrumentation recorders. The analyzer is portable, requires no warmup period and need not

be calibrated for normal usage. Average setup time with this analyzer is approximately 30 seconds per track.

B68-10258
ACQUISITION OF PSEUDONOISE SIGNALS BY
SEQUENTIAL ESTIMATION
WARD, R. B. /LOCKHEED MISSILES AND SPACE CO./
DATE- JUL. 1968
M-FS-13898

Rapid Acquisition by Sequential Estimation /RASE/ system is used in the receivers of tracking and communications systems to bring identical locally generated pseudonoise digital modulation signal into time synchronization with the incoming pseudonoise signal. This acquisition system is particularly suited for medium input signal-to-noise ratios.

B68-10262
SILICON STRAIN SENSORS ENABLE PRESSURE
MEASUREMENT AT CRYOGENIC TEMPERATURES
BOWMAN, R. BURNS, J. MC LELLAN, W.
/ELECTRO-OPTICAL SYSTEMS/ DATE- JUL. 1968
M-FS-14703

Miniature pressure transducers with diffused, heavily doped silicon strain-gage sensor elements, operates over a wide temperature range. Small thermal mass combined with close coupling between a metallic diaphragm and sensor elements minimizes sensitivity to temperature transients.

B68-10263
IMPROVED FUEL-CELL-TYPE HYDROGEN SENSOR
RUDEK, F. P. RUTKOWSKI, M. D. /GE/ DATE- JUL.
1968
M-FS-14656

Modified hydrogen sensor replaces oxygen cathode with a cathode consisting of a sealed paste of gold hydroxide and a pure gold current collector. The net reaction which occurs during cell operation is the reduction of the gold hydroxide to gold and water, with a half-cell potential of 1.4 volts.

B68-10264
CONCEPTUAL DEAD WEIGHT DEVICE TO PROVIDE
PRESSURE CALIBRATION
KARCHER, G. OLSON, G. /CHRYSLER CORP./ DATEJUL. 1968
M-FS-14672

Dead weight testing device uses a common force plane piston manometer to set accurate gage pressure in pounds per square inch. An additional piston gage easily adapts the device for absolute pressure calibration.

B68-10267
MOEBIUS RESISTOR IS NONINDUCTIVE AND NONREACTIVE
DAVIS, R. L. DATE- JUL. 1968
SAN-10020

Moebius strip made of insulated resistive materials with electrical leads attached directly opposite one another provides a noninductive, nonreactive resistor which is simple, inexpensive, and flexible in usage, and can be made to almost any desired size and shape.

B68-10268
VIBRATION TESTING AND DYNAMIC STUDIES OF
RELAYS
INNOVATOR NOT GIVEN /OKLAHOMA STATE UNIV./
DATE- JUL. 1968
M-FS-14542

Study has been undertaken to determine the separation criteria for a preloaded, idealized set of contacts when they are subjected to a steady-state sinusoidal excitation and when the elasticity of one contact is nonlinear. The study consists of two phases, theoretical and experimental.

B68-10269
LOW ENERGY OHMMETER CAN BE USED TO TEST
SENSITIVE CIRCUITS, OTHER METERS
PLATT, L. W. DATE- JUL. 1968
SAN-10013

Hazardous circuit ohmmeter is of sufficiently low

energy output that it may be used to test extremely sensitive circuits safely, reliably, and accurately. A polyurethane-foam-lined aluminum case provided protection for the unit assembly.

B68-10272
NOISE FIGURE MEASUREMENT CONCEPT FOR
ACOUSTIC AMPLIFIERS
JOHNSON, V. R. YEAGER, J. R. /MICROWAVE
ELECTRON./ DATE- JUL. 1968
GSFC-10066

Optimum length buffer crystals are used with an amplification section for measuring the noise figure for acoustic amplifiers. Measuring the time required to saturate with noise a signal, which is reflected back and forth in the circuit, gives a direct measurement of the amplifiers noise figure.

B68-10273
RECHARGE UNIT PROVIDES FOR OPTIMUM
RECHARGING OF BATTERY CELLS
BAER, D. FORD, F. E. DATE- AUG. 1968
GSFC-10688

re-10000

Percent recharge unit permits each cell of a rechargeable battery to be charged to a preset capacity of the cell. The unit automatically monitors and controls a rechargeable battery subjected to charge-discharge cycling tests.

B68-10280
IGNITION OF BINARY ALLOYS OF URANIUM
BAKER, L., JR. BINGLE, J. D. SCHNIZLEIN, J. G.
DATE- AUG. 1968
ARG-10057

Experiments determine the effect of alloying additives on the ignition of uranium. Data on oxidation rates, ignition temperatures, and burning curves are provided in the report.

B68-10283 HIGH-VOLTAGE PULSE GENERATOR DEVELOPED FOR WIDE-GAP SPARK CHAMBERS

WIDE-GAP SPARK CHAMBERS
KELLER, L. P. WALSCHON, E. G. DATE- AUG. 1968
ARG-10136
Low-inductance, high-capacitance Marx pulse

Low-inductance, high-capacitance Marx pulse generator provides for minimization of internal inductance and suppression of external electromagnetic radiation. The spark gaps of the generator are enclosed in a pressurized nitrogen atmosphere which allows the charging voltage to be varied by changing the nitrogen pressure.

B68-10289
DEEP SPACE FM SYSTEM, A CONCEPT
DOLAND, G. D. /LOCHKEED ELECTRON. CO./ DATE-AUG. 1968
MSC-11825

Deep space frequency modulation system permits transmission of data where the signal deviation is greater than 1/2 the predetection bandwidth. It provides satisfactory performance at great distances or with low signal levels.

B68-10290
DYNAMIC LINEARITY MEASUREMENT TECHNIQUE
MERZ, K. MORRELL, L. /BOEING CO./ DATE- AUG.
1968
KSC-10186

Measurement technique involves frequency modulated discriminator which produces an error signal as two signals, one of known and one of unknown frequency. The signals are electronically switched to a discriminator input, allowing independent measuring of dynamic linearity in a frequency modulated subcarrier oscillator.

B68-10291 CRYGGENIC LIQUID LEVEL MEASURING PROBE DINKEL, J. A. WEGNER, C. R. DATE- AUG. 1968 ARG-10138

Universal probe, which contains a unique frequency discriminator, measures the static and dynamic levels of cryogenic liquids in a hydrogen bubble chamber. The probe allows boiling conditions or other turbulence to be observed throughout all the transition stages.

B68-10301
RANDDM ACCESS-RANDOM RELEASE RELAY SWITCHING
MATRIX
CARTER, J. A. EVANS, F. E. /N. AM. ROCKWELL
CORP./ DATE- AUG. 1968
M-FS-12590

XY relay switching matrix provides complete random access and random release of 400 points. A mercury-wetted bistable relay with independent set and reset coils is the unique feature associated with each point.

B68-10303 CONCEPTUAL APPARATUS FOR DETECTING LEAKS OF NONCONDUCTIVE LIQUIDS WALSH, G. D. /BOEING CO./ DATE- AUG. 1968 M-FS-14713

S-14/13
Apparatus detects leaks at joints in lines carrying electrically nonconductive liquids. The proposed apparatus could include a panel that would give a visual or audible indication of a leak /to permit manual shutdown/ and/or an electromechanical actuator that would automatically cut off the flow when a leak occurs.

B68-10305 CURRENT-LIMITING VOLTAGE REGULATOR CLEVELAND, E. F. DATE- AUG. 1968 MSC-11824

Voltage regulator, which operates within preset current limits, acts as a circuit breaker to prevent overload failure, and automatically resets when the overload is removed. The power dissipated in the series transistor of the circuit is constant from normal load to short circuit condition.

B68-10306
COMMUNICATION SYSTEM FEATURES DUAL MODE
RANGE ACQUISITION PLUS TIME DELAY
MEASUREMENT
ATWOOD, S. W. KLINE, A. W., JR. WELTER

ATWOOD, S. W. KLINE, A. W., JR. WELTER, N. E. /MOTOROLA/ DATE- AUG. 1968
M-FS-14323 M-FS-14324

Communication system combines range acquisition system and time measurement system for tracking high velocity aircraft and spacecraft. The range acquisition system uses a pseudonoise code to determine range and the time measurement system reduces uncontrolled phase variations in the demodulated signal.

B68-10307 ENCAPSULATION TECHNIQUE ELIMINATES THERMAL STRESSES IN WELDED ELECTRONIC MODULES KIMMEL, M. /N. AM. ROCKWELL CORP./ DATE- AUG. 1968 SEE ALSO B67-10367 M-FS-14581

Encapsulation technique minimizes embedment and thermal stresses in welded electronic modules. A coating of thinned room-temperature- vulcanizing silicone rubber having a high coefficient of expansion and flexibility at low temperature, is applied first and then an encapsulating epoxy resin having a relatively low coefficient of expansion is added.

B68-10308
SOLID STATE HIGH-VOLTAGE PULSER OPERATES
WITH LOW SUPPLY VOLTAGE
MILBERGER, W. E. /WESTINGHOUSE ELEC. CORP./
DATE- AUG. 1968
M-FS-14034

High speed klystron cathode pulser requires low voltage to generate high-voltage pulses. Broadband video transformers are wound in two configurations - /1/ transmission line, multifilar toroids and /2/ loop coupling toroids. The circuit adapts to generate high-speed, high-voltage, high-stability power pulses at megawatt levels.

B68-10309 FEASIBILITY STUDY OF WIRELESS POWER TRANSMISSION SYSTEMS ROBINSON, W. J., JR. DATE- AUG. 1968 M-FS-14691

Wireless microwave or laser energy transfers power from a manned Earth-orbiting central station to

unmanned astronomical substations. More efficient systems are required for the microwave power transmission.

B68-10310
STANDARDS FOR COMPATIBILITY OF PRINTED
CIRCUIT AND COMPONENT LEAD MATERIALS
INNOVATOR NOT GIVEN /MARTIN CO./ DATE- AUG.
1968

Study of packaging of microminiature electronic components reveals methods of improving compatibility of lead materials, joining techniques, transfer molding concepts, printed circuit board materials, and process and material specifications.

B68-10311
IMPROVED ELECTRO-OPTICAL TRACKING SYSTEM
JOHNSON, R. E. WEISS, P. F. /SYLVANIA ELECTRON.
SYSTEMS/ DATE- AUG. 1968
M-FS-14791

Electro-optical tracking system employs a laser beam illuminating source, an electronic laser beam deflector, and an image dissector photomultiplier. An electronic scanning transmitter and receiver follows rapid movements or accelerations of the target.

B68-10312 SYSTEM MEASURES ARC ENERGY DISSIPATED IN RELAY CONTACT CYCLING INNOVATOR NOT GIVEN /OKLAHOMA ST. UNIV./ DATE- AUG. 1968 M-FS-14541

System, containing cycle timer, measures the energy dissipated at the contacts of a relay operating in an electric circuit. The system measures as well as records the energy for a large number of repetitive operations.

B68-10313 ANALYSIS AND DESIGN OF A CLASS-D AMPLIFIER INNOVATOR NOT GIVEN /AUBURN UNIV./ DATE-AUG. 1968 M-FS-14803

Analysis of a basic class-D amplifier circuit configuration shows its adaptability to a variety of applications. The feedback, input and output configuration and the frequency spectrum of the pulse-width-modulated signal are analyzed.

B68-10314 COLOR-TELEVISED MEDICAL MICROSCOPY HEATH, M. A. PECK, J. C. DATE- AUG. 1968 MSC-13086

Color-television microscopy used at laboratoryrange magnifications, reproduces a slide image with sufficient fidelity for medical laboratory and instructional use. The system is used for instant pathological reporting between operating room and remotely located pathologist viewing a biopsy through this medium.

B68-10315 GIMBAL ANGLE SENSOR ZAREMBA, J. G. /TRW SYSTEMS GROUP/ DATE- AUG. 1968 GSFC-10305

Detector flake located parallel to a slotted mask mechanical differentiator, senses the rotation of a gimballed reaction wheel mounting. As the gimbal moves light passes through the mask and strikes a section of the detector, the electrical output of which has been calibrated in terms of degrees of rotation.

B68-10316
OPTIMETRIC SYSTEM FACILITATES COLORIMETRIC
AND FLUOROMETRIC MEASUREMENTS
HALEY, F. C. DATE- AUG. 1968
NPO-10233

Compact, unitary optimetric systems uses a single device for colorimetric, fluorometric and spectral absorption measurements. The basic element of the unitary systems is a test cell containing filter elements with uniquely fabricated lenses.

B68-10317
METHOD OF REDUCING TIME BASE ERROR IN
DIGITAL MAGNETIC RECORDERS
MOORE, J. M. /ELECTRO-MECHAN. RES./ DATE- AUG.
1968
GSFC-10108

Apparatus reduces Time Base Error /TBE/ in the playback of digital data from magnetic recording equipment. The apparatus uses a magnet which employs a servo position control of the tape by which the playback data clock is phase locked with a fixed frequency reference signal.

B68-10319
ULTRASONIC TEMPERATURE MEASURING DEVICE
CARNEVALE, E. H. LYNNWORTH, L. C. /PARAMETRICS/
DATE- AUG. 1968
LEWIS-10446

Pulse echo ultrasonic system automatically determines the temperature in the core of a nuclear rocket engine by measuring the transit time of an acoustic pulse in a wire sensor. The measurement is based on the fact that the speed of sound in the sensor material is a function of temperature.

B68-10321 CONCEPT TO CONVERT ELECTRICAL POWER RATTI, N. /LEAR SIEGLER/ DATE-AUG. 1968 GSFC-10222

Moving fluid conductor transforms electrical power from one voltage to another. The electrically conductive fluid acts as a coupling medium between or among multiple electromagnetic fields producing the conversion.

B68-10323 HYDROGEN SAFETY MANUAL DATE- AUG. 1968 SEE ALSO NASA-SP-5032 AND NASA-TM-X-52454 LEWIS-10487

Hydrogen safety manual covers the characteristics and nature of hydrogen, design principles for hydrogen systems, protection of personnel and equipment, and operating and emergency procedures. It sets standards and practices for minimum safety requirements at hydrogen installations.

B68-10325
ELECTROCHEMICAL CELL HAS INTERNAL RESISTIVE
HEATER ELEMENT
COLSTON, E. F. FORD, F. E. HENNIGAN, T. J.
DATE- AUG. 1968
GSFC-10358

External source supplies power to electrochemical cells containing internal resistive heater element. Each cell plate is individually contained in its own Pellon bag, enabling the heater element to be arranged in a continuous, parallel circuit.

B68-10327
POWER CONSUMPTION IN ACOUSTIC AMPLIFIERS
UNDER CONDITIONS OF MAXIMUM STABLE GAIN
JOHNSON, V. R. /MICROWAVE ELECTRON./ DATE- AUG.
1968
6SFC-10067

Comparison is made of the power consumed and the acoustic amplification realized when a dc bias field is placed across a piezoelectric semiconductor and adjusted to amplify a microwave acoustic signal to the point where the forward gain is just equal to the reverse attenuation. This represents the maximum possible gain condition.

B68-10328
TRANSISTORIZED MARX BANK PULSE CIRCUIT
PROVIDES VOLTAGE MULTIPLICATION WITH
NANOSECOND RISE-TIME
JUNG, E. A. LEWIS, R. N. DATE- AUG. 1968
ARG-10110

Base-triggered avalanche transistor circuit used in a Marx bank pulser configuration provides voltage multiplication with nanosecond rise-time. The avalanche-mode transistors replace conventional spark gaps in the Marx bank. The delay time from an input signal to the output signal to the output signal to the output is typically 6 nanoseconds.

B68-10330 SIMULTANEOUS MESSAGE FRAMING AND ERROR DETECTION FREY, A. H., JR. /IBM/ DATE- SEP. 1968 MSC-12001

Circuitry simultaneously inserts message framing information and detects noise errors in binary code data transmissions. Separate message groups are framed without requiring both framing bits and error-checking bits, and predetermined message sequence are separated from other message sequences without being hampered by intervening noise.

B68-10333 AUTOMATIC, NONDESTRUCTIVE TEST MONITORS IN-PROCESS WELD QUALITY DEAL, F. C. /MARTIN CO./ DATE- SEP. 1968 M-FS-14996

Instrument automatically and nondestructively monitors the quality of welds produced in microresistance welding. It measures the infrared energy generated in the weld as the weld is made and compares this energy with maximum and minimum limits of infrared energy values previously correlated with acceptable weld-strength tolerances.

B68-10336
FULLY AUTOMATIC TELEMETRY DATA PROCESSOR
COX, F. B. /BECKMAN INSTR. CO./ KEIPERT, F. A.
LEE, R. C. DATE- SEP 1968 SEE ALSO
NASA-TN-D-3981
GSFC-10576

/Satellite Telemetry Automatic Reduction System /STARS 2/, a fully automatic computer-controlled telemetry data processor, maximizes data recovery, reduces turnaround time, increases flexibility, and improves operational efficiency. The system incorporates a CDC 3200 computer as its central element.

B68-10337
TEMPERATURE OR PRESSURE CONTROLLER
GILLETT, J. D. /N. AM. ROCKWELL CORP./ DATESEP. 1968
LEWIS-10297

Silicon chip thermal sensor coupled into a solid state power source controls temperature or pressure in combustion research. The silicon chip sensing element is embedded in a ceramic support for insulation, and connected to a high resistance bridge which operates the solid state power amplifiers.

B68-10341
SUPERCONDUCTIVE THIN FILM MAKES CONVENIENT
LIQUID HELIUM LEVEL SENSOR
BECKER, H. H. DATE- SEP. 1968
LANGLEY-10289

Sensor consisting of superconductive film mounted on a dipstick measures the level of liquid helium in a Dewar flask. The sensor is made by depositing a thin film of niobium metal to a thickness of 2000 angstroms on a quartz substrate, which is then mounted on a graduated dipstick.

B68-10342
INDIUM ADHESION PROVIDES QUANTITATIVE
MEASURE OF SURFACE CLEANLINESS
KRIEGER, G. L. WILSON, G. J. DATE- SEP. 1968
SAN-10024

--10024 Indium tipped probe measures hydrophobic and hydrophilic contaminants on rough and smooth surfaces. The force needed to pull the indium tip, which adheres to a clean surface, away from the surface provides a quantitative measure of cleanliness.

B68-10350 FLUIDIC-THERMOCHROMIC DISPLAY DEVICE GRAFSTEIN, D. HILBORN, E. H. DATE- SEP. 1968\_ SEE ALSO NASA-CR-80016 AND NASA-CR-86031 ERC-10031

Fluidic decoder and display device has low-power requirements for temperature control of thermochromic materials. An electro-to-fluid converter translates incoming electrical signals into pneumatics signal of sufficient power to

operate the fluidic logic elements.

B68-10357
CLOSED CIRCUIT TV SYSTEM AUTOMATICALLY
GUIDES WELDING ARC
STEPHANS, D. L. /HAYES INTERN. CORP./ WALL, W.
A., JR. DATE- SEP. 1968
M-FS-20084

Closed circuit television /CCTV/ system automatically guides a welding torch to position the welding arc accurately along weld seams.

Digital counting and logic techniques incorporated in the control circuitry, ensure performance reliability.

B68-10362 RATING OF ELECTRICAL WIRES IN VACUUM ENVIRONMENTS

ENVIRONMENTS SCHAEFER, J. L. SVENSON, F. C. /N. AM. ROCKWELL CORP./ DATE- OCT. 1968 MSC-15108

Electric conductors used in vacuum environments have smaller cross sections. This report provides data on the correct size wire for a required current load in free-air, low-pressure oxygen, and vacuum environments.

B68-10364
NONDESTRUCTIVE TEST DETERMINES OVERLOAD
DESTRUCTION CHARACTERISTICS OF CURRENT
LIMITER FUSES
SWARTZ, G. A. /ELECTRA-MIDLAND CORP./ DATE- OCT.
1968
XGS-08566

Nondestructive test predicts the time required for current limiters to blow /open the circuit/ when subjected to a given overload. The test method is based on an empirical relationship between the voltage rise across a current limiter for a fixed time interval and the time to blow.

B68-10365
AUTOMATIC PATIENT RESPIRATION FAILURE
DETECTION SYSTEM WITH WIRELESS TRANSMISSION
DIMEFF, J. POPE, J. M. DATE- OCT. 1968
ARC-10174

Automatic respiration failure detection system detects respiration failure in patients with a surgically implanted tracheostomy tube, and actuates an audible and/or visual alarm. The system incorporates a miniature radio transmitter so that the patient is unencumbered by wires yet can be monitored from a remote location.

B68-10367
DETECTION OF EFFECT OF DEPOSITS ON OPTICAL WINDOWS OF PYROMETER MEASUREMENTS CIPOLONE, P. DATE- OCT. 1968
LEWIS-10366

Temperatures measurements in an enclosed test chamber are more accurate when the reflectivity of the inner coated surface is compared to the outer clean surface of an optical window. Temperature readings are corrected by correlating the reflectivity of the deposits with their effect on the temperature measurement.

B68-10370
COOLED MINIATURE PRESSURE TRANSDUCERS
EFFECTIVE AT HIGH TEMPERATURES
ARMENTROUT, E. C. DATE- OCT. 1968
LEWIS-10401

Miniature pressure transducers in compact water-cooled mounts are placed in hotter and more confined environments than previously possible. It quantitatively measures high frequency total pressure fluctuations resulting from rotating stall in an axial flow engine compressor.

B68-10379
AUTOMATIC SYSTEM NONDESTRUCTIVELY MONITORS
AND RECORDS FATIGUE CRACK GROWTH
HOPPE, F. INMAN, N. S. /FAIRCHILD HILLER CORP./
DATE- UCT. 1968
LANGLEY-10091

Ultrasonic reflection system automatically and nondestructively detects and records the propagation of fatigue cracks in test specimens undergoing fatigue cycling. A reflector plate

obtains a reference signal and monitors the location of the tip of a propagating fatigue crack.

B68-10382 SYSTEM MEASURES RESPONSE TIME OF PHOTOMULTIPLIER TUBES LAUVER, M. R. DATE- OCT. 1968 LEWIS-10437

calibration system enables precise determination of rise time of photosensitive detectors. To perform a calibration, the time-voltage curve of the excitation voltage for a light source is compared with the time-voltage curve of the voltage output from a photosensitive detector which is responding to the light.

B68-10384
IMPROVED LIMITER FOR TURN-ON CURRENT
TRANSIENT
HALLBERG, F. C. DATE- OCT. 1968
GSFC-10413

Circuit limits the turn-on current transient to a specified amplitude and provides a low-impedance path between supply voltage and load after a prescribed time interval. The circuit offers a wide range of flexibility in adjusting peak current and automatic control of the initial peak current.

B68-10386 LOW-COST, FAST-RESPONSE DRIVE CIRCUIT FOR ELECTROMAGNETIC TORQUE MOTORS ZELLER, J. R. DATE- OCT. 1968 LEWIS-10143

Fast-response coil drive circuit, for electromagnetic torque motors, reduces the inductive coil time constant with a minimum of circuit sophistication. The low-cost modulator servoamplifier is used with a compatible preamplifier stage which provides the servo-loop function of summing, adjustable gain and compensation

B68-10388
METHOD FOR REDUCING SNAP IN MAGNETIC
AMPLIFIERS

FISCHER, R. L. E. WORD, J. L. DATE- OCT. 1968 LEWIS-10388

Method of reducing snap in magnetic amplifiers uses a degenerative feedback circuit consisting of a resistor and a separate winding on a magnetic core. The feedback circuit extends amplifier range by allowing it to be used at lower values of output current.

B68-10389 METHOD FOR MAKING SMALL POINTED THERMOCOUPLES STOVER, C. M. DATE- OCT. 1968 SAN-10014

Constantan wire worked to a needle point and covered with a copper coating produces a small, concentric, fast-reaction thermocouple that has the fast response time necessary to measure rapid temperature changes accurately and only slightly alters the environment being measured.

B68-10397
CHARTS DESIGNATE PROBABLE FUTURE
DCEANOGRAPHIC RESEARCH FIELDS
INNOVATOR NOT GIVEN /MCDONNELL DOUGLAS CO./
DATE- OCT. 1968
M-FS-20202

Charts outline the questions and problems of oceanographic research in the future. NASA uses the charts to estimate the probable requirements for instrumentation carried by satellites engaged in cooperative programs with other agencies concerned with identification, analysis, and solution of many of these problems.

B68-10399
AUTOMATIC SOLAR LAMP INTENSITY CONTROL
SYSTEM
LEVERONE, H. MANDELL, N. DATE- NOV. 1968
XGS-10017
System that substitutes solar cells directly in
the path of the radiation incident on the test

volume and uses a dc bridge-null system was developed. The solar cell is affixed to a heat sink mounted on each of three arms for each solar lamp. Control of the radiation from the solar lamps is automatic.

B68-10400
LITHIUM-TELLURIUM BIMETALLIC CELL HAS
INCREASED VOLTAGE
CAIRNS, E. J. ROGERS, G. L. SHIMOTAKE, H. DATENOV. 1968
ARG-10141

G-10141
Lithium-tellurium secondary cell with a fused lithium halide electrolyte, tested in the temperature range 467 degrees to 500 degrees C, showed improvement over the sodium bismuth cell. The voltage of this bimetallic cell was increased by using the more electropositive anode material, lithium, and the more electronegative cathode material, tellurium.

B68-10402 SYSTEM FOR MEASURING SPATIAL DISTRIBUTION OF EJECTED DROPLETS, A CONCEPT AYVAZIAN, R. A. /N. AM. ROCKWELL CORP./ DATE-NOV. 1968 NPO-10185

System measures the spatial distribution of high-velocity droplets ejected from a nozzle or spray gun. The system employs an electrically resistive grid as the sensing screen, electrical leads, and a signal scanner such as a cathode ray tube.

B68-10404
DESIGN CONCEPT FOR NONARCING ELECTRICAL
CONNECTOR
HOLMEN, R. E. /DOUGLAS AIRCRAFT CO./ DATE- NOV.
1968
M-FS-14937

Connector plug automatically minimizes arcing during mating and demating. This plug uses a high-resistivity outer sheath as an extension to the regular pin contact. It is used in atmospheres containing explosive gases, and reduces erosion at the contact surfaces where mating and demating are performed frequently.

B68-10411
INVERTED GROUNDING TECHNIQUE FOR ELECTRON
BEAM HEATING
JIRBERG, R. J. DATE- DEC. 1968
LEWIS-10543

In the production of high temperatures by electron bombardment the cathode is held at ground potential while the hot anode is raised to a high negative potential. An annealing chamber using the inverted grounding is constructed around a commercially available stainless steel \*\*cross.\*\*

B68-10412 AUTOMATIC CALIBRATION SYSTEM FOR PRESSURE TRANSDUCERS INNOVATOR NOT GIVEN /G. T. SCHJELDAHL CO/. DATE- DEC. 1968 M-FS-20127

Fifty-channel automatic pressure transducer calibration system increases quantity and accuracy for test evaluation calibration. The pressure transducers are installed in an environmental tests chamber and manifolded to connect them to a pressure balance which is uniform.

B68-10413
UV DETECTOR MONITORS ORGANIC CONTAMINATION
OF OPTICAL SURFACES
GLENN, C. G. KENNEDY, B. W. DATE- DEC. 1968
M-FS-20246

Silicon carbide, insensitive to visible light, is used in photodetectors. System contamination can be monitored during the normal operation without interference to the operator, and without shielding from ambient light.

B68-10415
NEW BIMETALLIC EMF CELL SHOWS PROMISE IN
DIRECT ENERGY CONVERSION
HESSON, J. C. SHIMOTAKE, H. DATE- NOV. 1968
ARG-10183

#### 01 ELECTRICAL (ELECTRONIC)

Concentration cell, based upon a thermally regenerative cell principle, produces electrical energy from any large heat source. This experimental bimetallic EMF cell uses a sodium-bismuth alloy cathode and a pure liquid sodium anode. The cell exhibits reliability, corrosion resistance, and high current density performance.

B68-10420
HIGH RESOLUTION GE /LI/ SPECTROMETER
REDUCES RATE-DEPENDENT DISTORTIONS AT HIGH
COUNTING RATES
BRENNER, R. LARSEN, R. N. MANN, H. M. RUDNICK,
S. J. SHERMAN, I. S. STRAUSS, M. G. DATE- NOV.
1968
ARG-10144

Modified spectrometer system with a low-noise preamplifier reduces rate-dependent distortions at high counting rates, 25,000 counts per second. Pole-zero cancellation minimizes pulse undershoots due to multiple time constants, baseline restoration improves resolution and prevents spectral shifts.

DESIGN CONCEPT FOR A RAPID AUTOMATIC SYNC ACQUISITION SYSTEM ANDERSON, T. O. GAILO, A. J. DATE- NOV. 1968 NPO-10214

System intends to provide rapid command sync acquisition between widely separated transmitter-neceivers, such as a spacecraft telemetry transmitter and a ground-based receiver. The system facilitates rapid sync acquisition between stations and regains data lock after interruption or equipment failure.

D68-10429
CONDITIONING FLAT CONDUCTORS FOR FLAT
CONDUCTOR CABLE PRODUCTION
INNOVATOR NOT GIVEN /VITRO CORP. OF AMER./
DATE- DEC. 1968
M-FS-14914

Apparatus can straighten, anneal, clean, and apply a tension to stretch a cable one percent to assure uniform cross-sectional area. A conductor passes through temperature controlled distilled water and through a toroid coil. As the conductor enters the water, steam performs the cleaning action. Quenching and annealing also take place.

B68-10430 SYSTEM CONVERTS OPTICAL PHASE CHANGES TO RF PHASE CHANGES LOGUE, S. S. /GEN. DYN./CONVAIR/ DATE- NOV. 1968

M-FS-20091 System converts phase changes at optical frequencies to equal phase changes at RF. Thi

frequencies to equal phase changes at RF. This system operates in conjunction with either a Michelson interferometer or conventional interferometers.

B68-10431 CHARGE CONTROL OF NICKEL-CADMIUM BATTERIES BY COULOMETER AND THIRD ELECTRODE METHOD FORD, F. PAULKOVITCH, J. DATE- SEP. 1968 GSFC-10487

Combined coulometer/third electrode control circuit for a nickel-cadmium battery included at least one cell of the third electrode type is illustrated. The coulometer/third electrode sensing circuit controls the series regulator as necessary to maintain the sensing voltage at the preset sensing level.

B68-10432 HIGH-EFFICIENCY STEP-UP REGULATOR LISTER, L. R. /SPERRY RAND CORP./ DATE- DEC. 1968 M-FS-20049

Single-ended step-up regulator-chopper power supply /employing conventional chopper circuitry/ combines the advantages of the chopper and switching regulator circuits. Schematic of the power supply incorporating the step-up regulator is shown.

B68-10434
SELECTIVE VIDEO BLANKING TECHNIQUE
SABOE, M. M. TREUDE, R. C. /WESTINGHOUSE ELEC.
CORP./ DATE- DEC. 1968
M-FS-20013

Adverse viewing effects caused by faulty photosensitive elements are eliminated. A linear maximal /or nonmaximal/ sequence generator gives a pseudorandom pulse train to selectively blank the display monitor during specified mosaic interrogation times. The outputs minimize the length of the required shift register generator.

B68-10436 COMPACT ROTATING CUP ANEMOMETER WELLMAN, J. B. DATE- DEC. 1968 NPD-10563

Compact, collapsible rotating cup anemometer is used in remote locations where portability and durability are factors in the choice of equipment. This lightweight instrument has a low wind-velocity threshold, is capable of withstanding large mechanical shocks while in its stowed configuration, and has fast response to wind fluctuations.

B68-10437
TWO-WAY DIGITAL DRIVER/RECEIVER USES ONE
SET OF LINES
BURNETT, G. J. PFEIFER, A. F. /N. AM. ROCKWELL
CORP./ DATE- OCT. 1968
ERC-10055

Two-way /bilateral/ digital driver/receiver system using MDS circuits was designed for a multiprocess computer having several subsystems at relatively close locations. The system requires only a single set of communication lines between subsystems, thus achieving lower cost with increased reliability.

B68-10438 NOSEPIECE RESPIRATION MONITOR LAVERY, A. L. LONG, L. E. RICE, N. E. DATE-SEP. 1968 ERC-10136

Comfortable, inexpensive nosepiece respiration monitor produces rapid response signals to most conventional high impedance medical signal conditioners. The monitor measures respiration in a manner that produces a large signal with minimum delay.

B68-10443
SHORT CIRCUIT PROTECTION FOR A POWER
DISTRIBUTION SYSTEM
OWEN, J. R., III /IBM/ DATE- JAN. 1969
M-FS-14993

Sensing circuit detects when the output from a matrix is present and when it should be present. The circuit provides short circuit protection for a power distribution system where the selection of the driven load is accomplished by digital logic.

B68-10456 AMPLIFIER IMPROVEMENT CIRCUIT STURMAN, J. DATE- DEC. 1968 LEWIS-10712

Stable input stage was designed for the use with a integrated circuit operational amplifier to provide improved performance as an instrumentation-type amplifier. The circuit provides high input impedance, stable gain, good common mode rejection, very low drift, and low output impedance.

B68-10501
READOUT SYSTEM FOR RADIATION DETECTOR
BAKER, B. R. CASHION, K. D. DATE- NOV. 1968
MSC-90180

Improved electrical circuit determines the amount of light detected by a photomultiplier tube when its output signal is in the dark-current range of the tube. The low-intensity light to which the tube responds arises from a thermo-luminescent ionized dosimeter.

B68-10502 RAPID-RESPONSE, LIGHT-EXPOSURE CONTROL SYSTEM KUEHL, D. K. ZWILLENBERG, M. L. /UNITED AIRCRAFT CORP./ DATE- DEC. 1968 NPO-10238

J-1028
Rapid-response electro-optical, light exposure control system, will maintain the light reaching a camera film or other light-sensitive detector at essentially constant level, despite wide variations in the brightness of the light source. The system permits detailed photographic or photoelectric recording of the phenomenon over a range of brightnesses.

B68-10505 LONG-TERM DATA STORAGE AND RETRIEVAL SYSTEM, A CONCEPT FOX, T. I. /BOEING CO./ DATE- NOV. 1968 M-FS-14789

Combination magnetic tape/microfilm system may give reliable long-term storage and immediate retrieval. The recording, storage, and retrieval of data would be accomplished by computers, without manual intervention. The proposed system retrieves data in less than one hour after being stored for periods of up to 50 years.

B68-10511
ROCKET ENGINE ANALOG SIMULATION
PHILYAW, B. K. RANDAZZO, G. J. /BOEING CO./
DATE- NOV. 1968
M-FS-14511

Mathematical equations simulate the operation of a rocket engine, simulate destructive and nondestructive tests to verify engine design feasibility, and investigate nonlinear variations in engine performance.

B68-10513 METHOD FOR MEASURING ALTERNATOR VOLTAGE TRANSIENTS PERZ, D. A. DATE- NOV. 1968 LEWIS-10373

Transient voltage detection circuit measures voltage excursions and recovery times resulting from step-load changes applied to a combination alternator-voltage regulator.

B68-10514 AUTOMATIC CALIBRATION APPARATUS FOR TELEMETRY SYSTEMS ALLEN, W. W. DATE- NOV. 1968 NPO-10560 NPO-10754

Apparatus automatically calibrates and tests spacecraft telemetry systems. The apparatus can generally be used to calibrate analog-to-digital converters.

B68-10516
HIGH-TEMPERATURE THERMIONIC EMISSION
MICROSCOPE
CAMPBELL, A. E., JR. HAMERDINGER, R. W.
/ELECTRO-OPT. SYSTEMS/ DATE- NOV. 1968
NPO-10584

Thermionic emission microscope was designed to operate with metal specimen cathode temperatures of 2000 degrees  ${\tt C.}$ 

INTEGRATED METAL TRANSISTOR LEADS
CARLEY, D. R. CASTERLINE, E. T. /RCA/ DATEJUL. 1968
GSFC-90536

Technique that makes the metal leads integral to the transistor wafer and reduces capacitance in the device, thereby increasing its efficiency is outlined.

B68-10525
DIGITAL LASER-BEAM DEFLECTION SENSOR
FOWLER, V. J. /GEN. TELEPHONE AND ELECTRON.
LABS./ DATE- NOV. 1968
M-FS-14785

Sensor automatically and accurately measures the two-dimensional deflection angles of a laser beam to provide closed-loop servomechanism control of laser beam directivity.

B68-10529
IMPROVED COMMUNICATION SYSTEM FOR LARGE
OPERATIONS CENTER

DRAPER, M. S. /BOEING CO./ DATE- NOV. 1968 M-FS-15016

When several microphones are fed into a common system, sound originating at any given source results in poor articulation. Introduction of an automatic microphone priority control suppresses echo and reverberation.

B68-10539 ACTIVE RC FILTER PERMITS EASY TRADE-OFF OF AMPLIFIER GAIN AND SENSITIVITY TO GAIN KERWIN, W. J. SHAFFER, C. V. DATE- NOV. 1968 ARC-10042

Passive RC network was designed with zeros of transmission in the right half of the complex frequency plane in the feedback loop of a simple negative-gain amplifier. The proper positioning provides any desired trade-off between amplifier gain and sensitivity to amplifier gain.

B68-10541
FAILURE RATES FOR ACCELERATED ACCEPTANCE
TESTING OF SILICON TRANSISTORS
TOYE, C. R. DATE- NOV. 1968
ERC-10198

Extrapolation tables for the control of silicon transistor product reliability have been compiled. The tables are based on a version of the Arrhenius statistical relation and are intended to be used for low- and medium-power silicon transistors.

B68-10542 HIGH DIELECTRIC THICK FILMS FOR SCREENED CIRCUIT CAPACITORS ULRICH, D. R. DATE- DEC. 1968 LANGLEY-10294

developed and materials have recently been developed to obtain high dielectric films /K of 300 to 800/. High dielectric barium titanate particles are mixed in a barium titanate glass.

B68-10543
TEMPERATURE CONTROLLED STRAIN GAGED
EXTENSOMETER
RAMOS, G. L. SEPLOW, S. /AEROJET GEN./ DATEDEC. 1968
LEWIS-10353

Temperature controlled strain-gaged extensometer measures longitudinal and girth deflections of pressure vessels in excess of one percent strain during pressurization and depressurization with cryogenic fluids at cryogenic temperatures. The device is of beryllium-copper strips.

B68-10544
COOLING OF 2-KW H SUBSCRIPT 2-O SUBSCRIPT
2 FUEL CELL
ALLAN, K. N. BJORKMAN, H. K. ELBERT, T. E.
HURLEY, J. R. /ALLIS-CHALMERS/ DATE- DEC. 1968
M-FS-13737 M-FS-13740 M-FS-13749
An extensive research and development program has been carried out to devise an improved method of removing waste heat of reaction from a developmental 2KW hydrogen-oxygen fuel cell.

B68-10545 A 35 GHZ SOLID STATE TRANSMITTER/DRIVER DE ANGELIS, X. A. DATE- DEC. 1968 M-FS-20152

Solid state transmitter/driver /multiplier/ signal source has been designed and fabricated to produce a stable crystal-controlled CW power output of 100 mw at 35 GHz.

B68-10547 OPERATIONAL INTEGRATOR LUTZ, E. B. DATE- NOV. 1968 NPO-10230

System operates in the nonreturn-to-zero mode, maintaining the increased bit density capability of this mode but with much higher noise immunity than conventional schemes offer. This integrator performs a mathematical integrating function on inputs from 100 Hz through 100 MHz.

B68-10555 ELECTROLYTIC SILVER ION CELL STERILIZES WATER SUPPLY ALBRIGHT, C. F. GILLERMAN, J. B. /GARRETT CORP./ DATE- DEC. 1968 SEE ALSU NASA-CR-65738 MSC-11827

Electrolytic water sterilizer controls microbial contamination in manned spacecraft. Individual sterilizer cells are self-contained and require no external power or control. The sterilizer generates silver ions which do not impart an unpleasant taste to water.

B68-10558
COMBINATION PROBE FOR AIRFLOW MEASUREMENTS
DUDZINSKI, T. J. GLAWE, G. E. KRAUSE, L. N.
DATE- DEC. 1968
LEWIS-10281

Probe combines a high-recovery shielded thermocouple for sensing total temperature, a total pressure sensing tube, and a flow direction sensing wedge having a 60 degree included angle.

B68-10559
ACCELERATION INSENSITIVE FLUID EXPANSION COMPENSATOR
HUGHES, L. F. /MIT/ DATE- OCT. 1968
ERC-10152

Device compensates for temperature and acceleration effects on a fluid-floated mass in a sealed container of a high performance angular or acceleration sensing instrument. It is used in precision instruments for regulation of gases or liquids in a moving body.

B68-10562
RELIABLE METHOD FOR TESTING GROSS LEAKS IN SEMICONDUCTOR COMPONENT PACKAGES ALTSHULER, T. L. DATE- DEC. 1968
ERC-10150

Simple, reliable, inexpensive method for gross-leak testing has been devised, based upon the conventional fine-leak technique. The sensitivity ranges from the detection of very large leaks down to leaks of 10 to the minus seven cc helium per sec.

B68-10563
PRESSURE-SENSITIVE BONDED JUNCTION
TRANSDUCERS
IANNINI, A. RINDNER, W. DATE- OCT. 1968
ERC-10087

Miniature transducers involve the use of appropriate commercial epoxy resins. Design protects the sensitive semiconductor surface from ambients and excludes an air space in the device capsule.

B68-10565 LOCATING \*\*SNEAK PATHS\*\* IN ELECTRICAL CIRCUITRY DANNBACK, T. M. /BOEING CO./ DATE- DEC. 1968 M-FS-15018

Use of a matrix system wherein circuit pin connections are assigned arbitrary designators and these used in formation of the matrix is illustrated. The matrix is a format that shows the current paths.

B68-10566
WELDING SKATE WITH COMPUTERIZED CONTROLS
WALL, W. A., JR. DATE- NOV. 1968
M-FS-20224

New welding skate concept for automatic TIG welding of contoured or double-contoured parts combines lightweight welding apparatus with electrical circuitry which computes the desired torch angle and positions a torch and cold-wire guide angle manipulator.

B68-10572
DESIGN OF DISSIPATIVE LINEAR PHASE FILTERS
PHARES, R. L. /SPACO, INC./ DATE- DEC. 1968
M-FS-14698

Set of design curves eliminates work involved in designing linear phase filters by being normalized in such a way as to apply to low, band, and high-pass filters of any bandwidth. Similar curves for any number of poles are plotted by solving a system of simultaneous equations.

#### 02 PHYSICAL SCIENCES (ENERGY SOURCES)

B68-10010
FLOW TUBE USED TO COOL SOLAR-PUMPED
LASER
INNOVATOR NOT GIVEN /RCA/ DATE- JAN. 1968
MSC-11026

A flow tube has been designed and constructed to provide two major functions in the application of a laser beam for transmission of both sound and video. It maintains the YAG laser at the proper operating temperature of 300 degrees K under solar pumping conditions, and it serves as a pump cavity for the laser crystal.

B68-10013
METHOD OF MEASURING THERMAL CONDUCTIVITY OF
HIGH PERFORMANCE INSULATION
HYDE, E. H. RUSSELL, L. D. /LOCKHEED MISSILES
AND SPACE CO./ DATE- JAN. 1968
M-FS-14088

Method accurately measures the thermal conductivity of high-performance sheet insulation as a discrete function of temperature. It permits measurements to be made at temperature drops of approximately 10 degrees f across the insulation and ensures measurement accuracy by minimizing longitudinal heat losses in the system.

B68-10021
OPTICAL SYSTEM FACILITATES INSPECTION OF PRINTED CIRCUIT BOARDS
CRIDLIN, M. OCONNOR, J. DATE- JAN. 1968
GSFC-07971

Optical comparator method determines the quality and registration of surface features of double-sided printed circuit boards. Color-coded superimposed images of both sides of a printed circuit board are presented to view, clearly showing details and registration of the circuitry.

B68-10060 NEW TECHNIQUE FOR OPTIMAL SMOOTHING OF DATA FRASER, D. C. /MIT/ DATE- MAY 1968 MSC-11354

Recursive method for the optimal smoothing of data has numerical superiority and is more easily understood in terms of physical reasoning than earlier methods. Using a Kalman filter, the smoothing technique, applied to a nonlinear parameter identification problem, is useful in those situations where linearization about a reference solution is valid.

B68-10071 IMPROVED OPTICAL DIFFRACTOMETER BILDERBACK, R. R. DATE- MAR. 1968 MSC-12055

Diffractometer is designed for diffraction measurements in the visible and near-infrared spectral regions. It provides higher resolution of diffraction patterns, an alternate illumination section for coherent light /from a laser source/, a unique alignment and adjustment arrangement for the optical system, and a very stable mounting.

B68-10077
ELECTRONIC GATING CIRCUIT AND ULTRAVIOLET
LASER EXCITATION PERMIT IMPROVED DOSIMETER
SENSITIVITY
EGGENBERGER, D. KING, D. LONGNECKER, A. SCHUTT,
D. /NOTRE DAME UNIV./ DATE- APR. 1968
ARG-10109

G-1019
Standard dosimeter reader, modified by adding an electronic gating circuit to trigger the intensity level photomultiplier, increases readout sensitivity of photoluminescent dosimeter systems. The gating circuit is controlled by a second photomultiplier which senses a short ultraviolet pulse from a laser used to excite the dosimeter.

B68-10081
INFRARED SPECTRORADIOMETER FOR ROCKET
EXHAUST ANALYSIS
HERGET, W. F. /N. AM. ROCKWELL CORP./ DATE- MAY

1968 M-FS-14357

Infrared spectroradiometer measures
high-resolution spectral absorption, emission,
temperature, and concentration of chemical species
in radically symmetric zones of the exhaust plumes
of large rocket engines undergoing static firingtests. Measurements are made along predetermined
lines of sight through the plume.

B68-10090 ANTIGLARE IMPROVEMENT FOR OPTICAL IMAGING SYSTEMS DAVIS, E. S. DATE- MAR. 1968 NPO-10337

Saffle configuration provides a more efficient shade against interfering sources of illumination outside the desired field of view of optical imaging systems. It consists of a semi-ellipsoid of revolution about the minor axis with black specular reflecting surface and an aperture defined by the locus of the foci of the generating ellipse.

B68-10098
RECTANGULAR CONFIGURATION IMPROVES
SUPERCONDUCTING CABLE
FOSS, M. LAVERICK, C. LOBELL, G. DATE- APR.
1968
ARG-90088

Superconducting cable for a cryogenic electromagnet with improved mechanical and thermal properties consists of a rectangular cross-sectioned combination of superconductor and normal conductor. The conductor cable has superconductors embedded in a metallic coating with high electrical and mechanical conductivity at liquid helium temperatures.

B68-10108
STUDY OF CRYDGENIC CONTAINER THERMODYNAMICS
DURING PROPELLANT TRANSFER
BROGAN, J. J. VERNON, R. M. /LOCKHEED MISSILES
AND SPACE CO./ DATE- MAY 1968
M-FS-14310

Study of thermodynamic phenomena occurring during transfer of cryogenic liquids from dewar to receiver tank reveals that the basic cause of tank implosion is evaporation rate of droplets entering the tank in the early transfer phase. Analyses of the thermodynamics involved and implosion prevention techniques are included.

B68-10113
ROCKET ENGINE NOZZLE PHOTOGRAPHIC
SYSTEM

BAILEY, R. L. TIBBITTS, W. C. DATE- APR. 1968 NPO-10174

Protective enclosure for a camera, located on the exhaust stream of a rocket engine, permits continuous recording of erosion processes of materials used in nozzle throat structures. The system uses a standard camera in a water-cooled, pressurized enclosure having a unique, inert gas-swept viewing duct.

B68-10119
MULTICHIP PACKAGING WITH THERMAL INSULATION
MC INTURFF, R. G. MEND, W. G. /WESTINGHOUSE
ELEC. CORP./ DATE- APR. 1968
M-FS-14076

Thermal insulation technique permits low and high power electronic chips to operate in the same package without thermal cross-coupling. An alumina glass shield thermally isolates the low power chip from the high power chip while Kovar substrate acts as a heat sink to remove heat from the high power chip.

OPTICAL INTEGRATING SPHERE OPERATES AT VISIBLE AND INFRARED WAVELENGTHS AISENBERG, S. /SPACE SCI./ DATE- APR. 1968 M-FS-14248

An optical integrating sphere with a faceted reflective lining on the inside surface will provide light randomization /mixing of diffusely and specularly reflected light/ with relatively few reflections. The improved sphere has a

sufficiently high reflectivity for both visible and infrared radiation.

B68-10128
PHOTOGRAPHIC AND DRAFTING TECHNIQUES
SIMPLIFY METHOD OF PRODUCING ENGINEERING
DRAWINGS

PROVISOR, H. /N. AM. AVIATION/ DATE- APR. 1968 MSC-716

Combination of photographic and drafting techniques has been developed to simplify the preparation of three dimensional and dimetric engineering drawings. Conventional photographs can be converted to line drawings by making copy negatives on high contrast film.

B68-10135
ANTECHAMBER FACILITATES LOADING AND
UNLOADING OF VACUUM FURNACE
KRAMER, P. J. MILLS, J. A. ORTH, N. W.
QUATINETZ, M. WAGNER, J. G. DATE- APR. 1968
LEWIS-10265

Antechamber facilitates the use of a furnace in which materials are heat treated in a high vacuum or a gas atmosphere. It has a high vacuum pumping system, a means for backfilling with a selected gas, an access door, glove ports, and a motor driven platform.

B68-10136
THE X SQUARE STATISTIC AND GOODNESS OF FIT
TEST
ARGENTIERO. P. D. MORRIS. R. A. /MARYLAND

ARGENTIERO, P. D. MORRIS, R. A. /MARYLAND UNIV./ TOLSON, R. H. /NASA, LANGLEY RES. CENTER/ DATE-APR. 1968 GSFC-10547

The X square statistic is a useful measure of the discrepancy between the actual distribution of a set of data points and the theoretical distribution of a random variable of which the data points supposedly are values. Thus the X square statistic is frequently used in goodness of fit tests.

B68-10143
DEEP GAMMA RAY PENETRATION IN THICK SHIELDS
ARMSTRONG, T. W. STEVENS, P. N. /TENN. UNIV./
DATE- APR. 1968
M-FS-14388

Appropriate importance function and sampling scheme facilitates the application of the Monte Carlo method to problems involving the deep penetration of radiation.

B68-10154
TOOL RECONSTRUCTS DATA INPUT POINTS
CORRESPONDING TO FIRST ORDER OUTPUT GRAPH
BIGGS, R. E. /N. AM. ROCKWELL CORP./ DATE- MAY
1968
M-FS-18003

Tool aids in graphic determination of input values for any first order lag system of known gain and time constant where the corresponding output function is displayed graphically and can be described by a first order differential equation. This tool permits a rapid reconstruction of input points.

B68-10160
ABSOLUTE LOW-PRESSURE CALIBRATION SYSTEM
ROEHRIG, J. R. /NATL. RES. CORP./ DATE- MAY 1968
M-FS-13085

McLeod gage is used as the primary reference standard in a system used for absolute calibration of vacuum gages in the very low pressure range. The system involves steady-state flow of a gas through a cascade of differentially pumped chambers or stages connected by precisely defined orifices.

B68-10170
LARGE-AMPLITUDE INVISCID FLUID MOTION IN AN ACCELERATING CONTAINER
PERKO, L. M. /LOCKHEED MISSILES AND SPACE CO./
DATE- JUN. 1968
MSC-11560

Study of dynamic behavior of the liquid-vapor interface of an inviscid fluid in an accelerating cylindrical container includes an

analytical-numerical method for determining large amplitude motion. The method is based on the expansion of the velocity potential in a series of harmonic functions with time dependent coefficients.

B68-10174 LOW SCATTER LIGHTWEIGHT FISSION SPECTROMETER CONSTRUCTED FOR BIOLOGICAL RESEARCH FRIGERIO, N. A. DATE- JUN. 1968

Low scatter, lightweight fission spectrometer provides a simple, reliable method for determining absolute neutron fluxes in a fixed neutron. It minimizes neutron scatter and energy degradation effects, and has a counting volume large enough to intercept the most energetic fission fragments, yet small enough to be discriminating.

B68-10178
CONCEPT TO COMFORT-CONDITION SUBJECTS
WEARING RESTRICTIVE CLOTHING
TUCKER, E. M. DATE- JUN. 1968
MSC-10964

ARG-10094

Heat exchanger maintains a desirable thermal balance in a subject wearing restrictive clothing. A grid of high thermal conductance fibers, in contact with the skin, transfers heat to or from the skin surface by means of a system of ducts, carrying the transfer fluid which is maintained at a controlled temperature.

B68-10179
APPLICATION OF A TRUNCATED NORMAL FAILURE
DISTRIBUTION IN RELIABILITY TESTING
GROVES, C., JR. /N. AM. ROCKWELL CORP./ DATEJUN. 1968
M-FS-14328

Statistical truncated normal distribution function is applied as a time-to-failure distribution function in equipment reliability estimations. Age-dependent characteristics of the truncated function provide a basis for formulating a system of high-reliability testing that effectively merges statistical, engineering, and cost considerations.

B68-10181 STUDY OF CONVECTIVE MAGNETOHYDRODYNAMIC CHANNEL FLOW SINGER, R. M. DATE- JUN. 1968 SEE ALSO ANL-6937 ARG-10102

Study involves the effects of the interactions of electromagnetic, velocity, and temperature fields to aid in the design of a magnetohydrodynamic device. It concerns a theoretical analysis of the convective flow of an electrically conducting gas in a channel composed of conducting walls.

B68-10186
MAGNETIC FORMING STUDIES
FURTH, H. P. HOLT, D. R. JATMUZ, P. J. MEHRA,
R. C. WANIEK, R. W. /ADVANCED KINET./ DATEJUN. 1968 SEE ALSO B65-10342
M-FS-14217

Investigation of the tensile strength dependability on the characteristic time over which a pressure pulse is applied to a metal workpiece shows that the mechanical properties of these materials are functions of the rate at which the material is undergoing strain. These results and techniques are used in magnetomotive metal forming.

B68-10190
PROCEDURE DEVELOPED FOR REPORTING
FAST-NEUTRON EXPOSURE
ROSSIN, A. D. DATE- JUN. 1968 SEE ALSO
ANL-6826
ARG-10035

Procedure for reporting fast-neutron exposure involves determination of the spectrum shape and absolute magnitude, selection of an energy weighting for the neutrons, and definition of a unit for reporting exposure. Using this method, comparisons of irradiation data from different reactors will be free from errors resulting from differences between the spectra.

B68-10228
THEORY OF A REFINED EARTH MODEL
KRAUSE, H. G. L. DATE- JUN. 1968
M-FS-14679

Refined equations are derived relating the variations of the earth\*s gravity and radius as functions of longitude and latitude. They particularly relate the oblateness coefficients of the odd harmonics and the difference of the polar radii /respectively, ellipticities and polar gravity accelerations/ in the northern and southern hemispheres.

B68-10234
DESIGN TECHNIQUES - STOCHASTIC CONTROLLERS
WIDNALL, W. S. /MIT/ DATE- JUL. 1968
MSC-11554

Analytic techniques aid in the design of nearly optimal linear time-varying sampled-data stochastic controllers. The techniques also aid in the simplification and automation of program designing for control computers.

B68-10240
PROPERTIES OF OPTICS AT HIGH TEMPERATURE AND THEIR MEASUREMENT, A STUDY GATES, D. W. DATE- JUL. 1968
M-FS-14696

Bibliography lists, the sources containing emissivity and absorptivity data on materials at extremely high temperatures. The experimental techniques, equipment and efforts of the experimenters to characterize the materials used and methods to evaluate the errors are given in the sources in this bibliography.

B68-10243
PORTABLE, HIGH INTENSITY ISOTOPIC NEUTRON
SOURCE PROVIDES INCREASED EXPERIMENTAL
ACCURACY
MOHR, W. C. STEWART, D. C. WAHLGREN, M. A.
DATE- JUL. 1968 SEE ALSO ANL-6917 AND
ANL-6933
ARG-90250

Small portable, high intensity isotopic neutron source combines twelve curium--americium--beryllium sources. This high intensity of neutrons, with a flux which slowly decreases at a known rate, provides for increased experimental accuracy.

B68-10245
IMPROVED RELAY OPTICAL ELEMENT FOR
SPECTRORADIOMETER USING CRYDGENICALLY
COOLED DETECTOR
KRAEMER, A. R. /LOCKHEED MISSILES AND SPACE CO./
DATE- JUL. 1968
MSC-11688

By coating half of one element in the relay optical system of a spectroradiometer with a very high emissivity paint, the effect of the reflected radiation from the back of the filter wheel is eliminated optically. This causes the detector to view a constant level of radiation, regardless of how the reflectivity of the back of the filter wheel changes.

B68-10252
NEW METHOD FOR CRITICAL FAILURE PREDICTION
OF COMPLEX SYSTEMS
COX, C. T. EAGLE, K. H. MALIK, D. F. WOLIN, S.
/BOEING CO./ DATE- JUL. 1968
M-FS-14133

Rigorous analytical technique, called criticality determination methodology /or CD technique/ determines the probability that a given complex system will successfully achieve stated objectives. The CD technique identifies critical elements of the system by a failure mode and effects analysis.

B68-10255
ELECTRO-OPTIC MODULATOR FOR INFRARED LASER
USING GALLIUM ARSENIDE CRYSTAL
WALSH, T. E. /RCA/ DATE- JUL. 1968
GSFC-10686

Gallium arsenide electro-optic modulator used for infrared lasers has a mica quarter-wave plate and two calcite polarizers to amplitude- or phase

modulate an infrared laser light source in the wavelength range from 1 to 3 microns. The large single crystal has uniformly high resistivities, is strain free, and comparable in quality to good optical glass.

B68-10259
FLUORESCENT PARTICLES ENABLE VISUALIZATION
OF GAS FLOW
WILSON, A. J. /N. AM. ROCKWELL CORP./ DATE- JUL.
1968 SEE ALSO B66-10668
M-FS-14583

Fluorescent particles enable visualization of the flow patterns of gases at slow velocities. Through a transparent section in the gas line, a camera views the visible light emitted by the particles carried by the gas stream. Fine definition of the particle tracks are obtained at slow camera shutter speeds.

B68-10260
TECHNIQUE DEVELOPED FOR MEASURING
TRANSMITTANCE OF OPTICAL BIREFRINGENT
NETWORKS
AMMANN, E. O. YARBOROUGH, J. M. /SYLVANIA PROD./
DATE- AUG. 1968 SEE ALSO B68-10275
M-FS-14267
The transmission characteristics of synthesized

The transmission characteristics of synthesized optical single-pass and double-pass birefringent networks is obtained by measuring network transmission as a function of network temperature. This technique is most useful for testing those birefringent networks whose bandwidths and periods are very small.

B68-10265 ACOUSTIC WAVE ANALYSIS JACKSON, E. D. /N. AM. ROCKWELL CORP./ DATE-JUL. 1968 M-FS-18076

The primary mechanism for generation of acoustic waves in a centrifugal pump, due to the rotor/stator interaction, is an unsteady source at the entrance of the blade row as represented by the unsteady velocity field. The amplitude of wave generated by pressure loading on the blades and by velocity boundary condition are compared.

B68-10275
SYNTHESIS OF ELECTRO-OPTIC MODULATORS FOR
AMPLITUDE MODULATION OF LIGHT
AMMANN, E. O. YARBOROUGH, J. M. /SYLVANIA ELEC.
PROD./ DATE- AUG. 1968
M-FS-14268

Electro-optical modulator realizes voltage transfer function in synthesizing birefringent networks. Choice of the voltage transfer function is important, the most satisfactory optimizes the modulator property.

B68-10276
SOLUTION OF DIFFERENTIAL EQUATIONS BY
APPLICATION OF TRANSFORMATION GROUPS
DRISKELL, C. N., JR. GALLAHER, L. J. MARTIN, R.
H., JR. /GEORGIA INST. OF TECH./ DATE- AUG. 1968
M-FS-14802

Report applies transformation groups to the solution of systems of ordinary differential equations and partial differential equations. Lie\*s theorem finds an integrating factor for a system of ordinary differential equations when the appropriate invariance group or groups can be found and can be extended to partial differential equations.

B68-10282 HIGH-SPEED CAMERA SYNCHRONIZATION ROJEC, E. A. /N. AM. ROCKWELL CORP./ DATE- AUG. 1968

Photoelectric sensor enables synchronization of the rotating mirror in a high-speed framing camera with the passage of a very-high-velocity droplet to obtain direct photographic data on droplet breakup. It detects droplet movement across a high intensity light beam and generates a signal triggering the camera. B68-10293
ISOTOPICALLY PURE MAGNESIUM ISOTOPE-24 IS
PREPARED FROM MAGNESIUM-24 OXIDE
CHELLEW, N. R. SCHILB, J. D. STEUNENBERG, R. K.
DATE- AUG. 1968
ARG-10154

G-10154

Apparatus is used to prepare isotopically pure magnesium isotope-24, suitable for use in neutron scattering and polarization experiments. The apparatus permits thermal reduction of magnesium-24 oxide with aluminum and calcium oxide, and subsequent vaporization of the product metal in vacuum. It uses a resistance- heated furnace tube and cap assembly.

B68-10294
STUDY OF RADIATION EFFECTS ON MAMMALIAN CELLS
IN VITRO
SINCLAIR, W. K. DATE- AUG. 1968
ARG-10191

F-10191
Radiation effect on single cells and cell populations of Chinese hamster lung tissue is studied in vitro. The rate and position as the cell progresses through the generation cycle shows division delay, changes in some biochemical processes in the cell, chromosomal changes, colony size changes, and loss of reproductive capacity.

B68-10298
DETECTION SENSITIVITIES IN 3-8 MEV
NEUTRON ACTIVATION
WAHLGREN, M. A. WING, J. DATE- AUG. 1968
SEE ALSO ANL-7242
ARG-10210

Study of detection sensitivities of 73 radioactive elements using fast unmoderated neutrons includes experiments for irradiation, cooling and counting conditions. The gamma ray emission spectra is used to identify the unknown material.

B68-10304
IMPROVED GAS RING LASER
COCCOLI, J. D. LAWSON, J. R. /MIT/ DATE- AUG.
1968
MSC-11584

Minimizing mode coupling improves sensing resolution of a gas ring laser in a gimballess gyroscope system or inertial rotation sensor. The piezoelectric-driven corner mirrors of the ring laser are oscillated in a direction parallel to their surfaces and the plane of rotation.

B68-10322 MODIFIED SINE BAR DEVICE MEASURES SMALL ANGLES WITH HIGH ACCURACY THEKAEKARA, M. DATE- AUG. 1968 GSFC-438

Wodified sine bar device measures small angles with enough accuracy to calibrate precision optical autocollimators. The sine bar is a massive bar of steel supported by two cylindrical rods at one end and one at the other.

B68-10326
4 PI-RECOIL PROPORTIONAL COUNTER USED AS NEUTRON SPECTROMETER
BENNETT, E. F. DATE- AUG. 1968 SEE ALSO ANL-6897
ARG-10101

Study considers problems encountered in using 4 pi-recoil counters for neutron spectra measurement. Emphasis is placed on calibration, shape discrimination, variation of W, the average energy loss per ion pair, and the effects of differentiation on the intrinsic counter resolution.

B68-10329 HIGH-SPEED PULSE CAMERA LAWSON, J. R. /MIT/ DATE- AUG. 1968 MSC-11353

Miniaturized, 16 mm high speed pulse camera takes spectral photometric photographs upon instantaneous command. The design includes a low-friction, low inertia film transport, a very thin beryllium shutter driven by a low-inertia stepper motor for minimum actuation time after a pulse command, and a binary encoder.

R68-10339 DYNAMICS OF MOVING BUBBLES IN SINGLE AND BINARY COMPONENT SYSTEMS
CLARK, J. A. MERTE, H., JR. TOKUDA, N. YANG, W.
J. /MICHIGAN UNIV./ DATE- SEP. 1968 M-FS-14845

Dynamics of a single bubble moving in a quiescent liquid is analyzed for single and binary component systems. The transport of energy and/or mass at thermodynamic-phase equilibrium governs the dynamics of the bubble at its interface.

#### B68-10345

INDEPENDENT DOUBLY TRUNCATED GAMMA VARIABLES LAVENDER, D. E. /GEORGIA UNIV./ DATE- SEP. 1968 M-FS-20143

Density and distribution functions of the sum of independent variables, each having a truncated gamma density function, were derived for use in the measurement of complex physical phenomena.

#### B68-10346 CONTROLLABILITY OF DISTRIBUTED-PARAMETER SYSTEMS

HERGET, C. J. /CALIF. UNIV./ DATE- SEP. 1968 M-FS-14929

Controllability of distributed-parameter control systems is mathematically studied. A general theory for control systems includes those that cannot be described by ordinary differential equations.

#### IMPROVEMENT IN RECORDING AND READING HOLOGRAMS HALLOCK, J. N. DATE- SEP. 1968

ERC-10151

Three-beam technique superimposes a number of patterns in the same plane of a hologram and then uniquely identifies each pattern by a suitable readout process. The developed readout process does not require any movement of parts.

STUDY OF OPTIMUM DISCRETE ESTIMATORS IN MEASUREMENT ANALYSIS HUNG, J. C. IRWIN, J. D. /TENNESSEE UNIV./DATE- SEP. 1968 M-FS-14915

Study of statistical techniques for obtaining estimates of true data parameters uses discrete measured quantities containing random error.

These techniques develop estimation procedures as an iterative algorithm for digital computation in real time.

#### B68-10349

M-FS-14522

LASER DOPPLER GAS-VELOCITY INSTRUMENT BOOTH, S. MEISTER, K. ROLFE, E. SILK, J. K. YOUNG, R. M. /RAYTHEON CO./ DATE- SEP. 1968 SEE ALSO B66-10693 M-FS-20039

Three-D instrument using a laser light source measures both turbulence and mean velocity of subsonic and supersonic gas flows. This instrument is based on the measurement of the Doppler frequency shift of light waves scattered by moving particles in the gas stream.

#### IMPROVED RADIOGRAPHIC IMAGE AMPLIFIER PANEL BROWN, R. L., SR. DATE- OCT. 1968

Layered image amplifier for radiographic /X-ray and gamma ray/ applications, combines very high radiation sensitivity with fast image buildup and erasure capabilities by adding a layer of material that is both photoconductive and light-emitting to a basic image amplifier and cascading this assembly with a modified Thorne panel.

#### B68-10396 EVALUATION OF SUPERCONDUCTING MAGNETS, A STUDY

DI SALVO, F. LUCAS, E. STEKLY, Z. J. J. STRAUSS, B. P. THOME, R. /AVCO EVERETT RES. LAB./ DATE- OCT. 1968
M-FS-14808

Study analytically develops and experimentally

verifies the steady state behavior characteristics of composite superconductors. Zero-dimensional. one-dimensional, and three-dimensional analyses were performed.

### FIBERGLASS PREVENTS CRACKING OF POLYURETHANE FOAM INSULATION ON CRYOGENIC VESSELS

FORGE, D. A. /MCDONNELL DOUGLAS CORP./ DATE-NOV. 1968 M-FS-20058

Fiberglass material, placed between polyurethane foam insulation and the outer surfaces of cryogenic vessels, retains its resilience at cryogenic temperatures and provides an expansion layer between the metal surfaces and the polyurethane foam, preventing cracking of the latter.

#### B68-10418

MINIATURIZED KING FURNACE PERMITS ABSORPTION SPECTROSCOPY OF SMALL SAMPLES ERCOLI, B. TOMPKINS, F. S. DATE- NOV. 1968 ARG-10177

Miniature King-type furnace, consisting of an inductively heated, small diameter tantalum tube supported in a radiation shield eliminates the disadvantages of the conventional furnace in obtaining absorption spectra of metal vapors.

#### B68-10426

CERIC AND FERROUS DOSIMETERS SHOW PRECISION FOR 50-5000 RAD RANGE FRIGERIO, N. A. HENRY, V. D. DATE- NOV. 1968 ARG-10173

3-10173
Ammonium thiocyanate, added to the usual ferrous sulfate dosimeter solution, yielded a very stable, precise and temperature-independent system - eight times as sensitive as the classical Fricke system in the 50 to 5000 rad range. The ceric dosimeters, promising for use in mixed radiation fields, respond nearly independently of LET.

## SOLVING NONLINEAR HEAT TRANSFER CONSTANT AREA FIN PROBLEMS

DATE- NOV. 1968 M-FS-14851

Tables and graphs were compiled for solving nonlinear heat transfer constant area fin problems. The differential equation describing one-dimensional steady-state temperature distribution and heat flow under three modes of heat transfer with heat generation was investigated.

## B68-10506

DUAL-PURPOSE CHAMBER-COOLING SYSTEM FRAZE, R. E. DATE- NOV. 1968 NPO-10467

Inexpensive, portable system was designed for cooling small environmental test chambers with a temperature-controlled gas stream evaporated from a cryogenic liquid. The system reduces the temperature of a chamber to any desired point in a fraction of the time required by previous systems.

COOLANTS WITH SELECTIVE OPTICAL FILTERING
CHARACTERISTICS FOR RUBY LASER APPLICATIONS
MC DEVITT, F. R. /AUBURN UNIV./ RASQUIN, J. R.
DATE- NOV. 1968 M-FS-20188

Coolant-filtering medium developed consists of a solution of copper sulfate in a 4-1 volumetric mixture of ethanol and methanol. This solution should be a useful addition to ruby laser systems, particularly in large pulse or Q-switching applications.

#### B68-10510 HEAT-LOAD SIMULATOR FOR HEAT SINK DESIGN DUNLEAVY, A. M. VAUGHN, T. J. /N. AM. ROCKWELL CORP./ DATE- NOV. 1968 CORP./ DA

Heat-load simulator is fabricated from 1/4-inch aluminum plate with a contact surface equal in dimensions and configuration to those of the

electronic installation. The method controls thermal output to simulate actual electronic component thermal output.

B68-10517
HEAT TRANSFER COEFFICIENTS FOR LIQUID
HYDROGEN TURBOPUMPS
BISSEL, W. R. WAGNER, W. R. /N. AM. ROCKWELL
CORP./ DATE- NOV. 1968
M-FS-18345

ro-10040
Empirical equations were derived to establish the appropriate heat transfer coefficients as functions of the temperature drops and heat transfer rates for a wide range of convective and boiling conditions at different locations in a liquid hydrogen turbopump.

B68-10519 HIGH CONDUCTANCE VAPOR THERMAL SWITCH HYMAN, N. L. DATE- SEP. 1968 GSFC-10109

High conductance vapor thermal switch was produced to maintain heat dissipating component temperatures within acceptable limits. The switch is a self-actuating, automatic device that regulates the rate of heat flow to control.

B68-10521
TELESCOPE DOME CONTROL SYSTEM AUTOMATICALLY
TRACKS SUN
CASHION, K. D. DATE- NOV. 1968
MSC-10966

Automatic control system is designed to rotate a dome so that a telescope, or other instruments, within the dome will continuously view the sun as the earth rotates.

B68-10533 A MASS FLUX PROBE FOR MEASUREMENT IN A SUPERSONIC STREAM GLAWE, G. E. KRAUSE, L. N. DATE- DEC. 1968 LEWIS-10695

Probe consists essentially of a tube with a supersonic inlet pointed into the gas stream. The mass flow rate through the tube is determined at a flow measuring station.

BOS-10340
IMAGING SLITLESS SPECTROMETER FOR X-RAY
ASTRONOMY
GURSKY, H. ZEHNPFENNIG, T. /AM. SCI. AND ENG./
DATE- NOV. 1968
M-FS-14309

Imaging slitness spectrometer, a combination of an X ray transmission /or reflection/ grating and image-forming X ray telescope, is capable of obtaining simultaneous spatial and spectral information about celestial X ray sources.

B68-10548
ONE-DIMENSIONAL COULOMB-DAMPED WAVE MOTION
IN PRISMATIC BARS
TOMLIN, D. D., JR. DATE- DEC. 1968
M-FS-14815

Study analyzes wave motions in prismatic bars with coulomb damping, using Laplace transforms as an aid in solving the partial differential equations. The results are detailed.

B68-10556
ELECTRON BEAM RECRYSTALLIZATION OF AMORPHOUS SEMICONDUCTOR MATERIALS EVANS, J. C., JR. DATE- DEC. 1968
LEWIS-10443

Nucleation and growth of crystalline films of silicon, germanium, and cadmium sulfide on substrates of plastic and glass were investigated. Amorphous films of germanium, silicon, and cadmium sulfide on amorphous substrates of glass and plastic were converted to the crystalline condition by electron bombardment.

B68-10560 SHORTENED PROCEDURE FOR OBTAINING REPRODUCIBLE COPIES OF 35 MM COLOR SLIDES LEVINE, F. /BOEING CO./ DATE- DEC. 1968 KSC-09957

Technique to reduce the steps required to obtain reproducible copies of 35 mm color slides has been

developed. A 35 mm slide is projected directly onto a Xerox plate, eliminating the necessity to produce a film positive of the slide.

B68-10564
REPETITIVELY PULSED, WAVELENGTH-SELECTIVE
CARBON DIOXIDE LASER
HANST, P. L. DATE- NOV. 1968
ERC-10178

Carbon dioxide laser as a simple portable unit generates coherent light pulses at selected infrared wavelengths. The improved laser was designed for the detection of air pollutants but can be applied to optical communications.

B68-10569
ACCURATE DIGITAL TECHNIQUE SIMULATES FLIGHT CONTROL SYSTEM HAYS, J. R. /BOEING CU./ DATE- NOV. 1968
M-FS-14787

Fast, accurate technique for simulating the Saturn Flight Control System was devised. The technique is simple to implement and can be readily substituted for slower or less accurate techniques. This technique can be applied to a large class of problems that require a rapid accurate calculation of the response of linear differential equations to a continuous input.

B68-10570
IMPROVED TECHNIQUE FOR DIGITAL SIMULATION
OF BENDING AND SLOSH PHENOMENA
STAUFFER, N. E. /BOEING CO./ DATE- NOV. 1968
M-FS-14788

Mathematical model representation of bending and slosh phenomena in the Saturn 5 vehicle results in linear second order differential equations. Improved technique was developed to provide a real-time digital solution of the equations. The technique may also be applied to non-real-time digital simulations, resulting in savings of digital computer time.

B68-10571
CORRECTION FOR LOSSES IN OPTICAL
BIREFRINGENT NETWORKS, A CONCEPT
AMMAN, E. O. /SYLVANIA ELEC. PROD./ DATE- NOV.
1968 SEE ALSO B68-10260 AND B68-10275
M-FS-20088

Technique determines the effects of losses upon the performance of a birefringent network and shows how the desired amplitude transmittance of the network may be corrected /or predistorted/, prior to synthesizing the birefringent network, to prevent the effects of crystal losses.

B68-10574
TRAINING MANUAL ON OPTICAL ALIGNMENT
INSTRUMENTS
DATE- DEC. 1968
M-FS-20292

Training Manual RQA/M5 provides a basic course of instruction in the use of optical instruments for precise dimensional control and alignment of structural elements and assemblies, such as associated with space vehicles, aircraft, ships, and buildings.

#### **03** MATERIALS (CHEMISTRY)

B68-10020
DISTILLATION DEVICE SUPPLIES CESIUM VAPOR AT
CONSTANT PRESSURE
BASIULIS, A. SHEFSIEK, P. K. /RCA/ DATE- FEB.
1968
XNP-08124

Distillation apparatus in the form of a U-tube supplies small amounts of pure cesium vapor at constant pressure to a thermionic converter. The upstream leg of the U-tube is connected to a vacuum pump to withdraw noncondensable impurities, the bottom portion serves as a reservoir for the liquid cesium.

B68-10023 HASTELLOY X PROPERTIES, DATA, AND METALLURGICAL CHARACTERISTICS GLASIER, L. F., JR. /AEROJET-GEN. CORP./ DATE-FEB. 1968 NUC-10302

Literature survey and testing program were initiated to obtain pertinent information for Hastelloy X, a nickel-base alloy, through the temperature range of minus 423 degrees to 1800 degrees F. A report has been prepared which includes the tensile properties, mechanical properties, and the manufacturing and fabrication processes.

B68-10029
HEAT TREATMENT PROCEDURE TO INCREASE
DUCTILITY OF DEGRADED NICKEL ALLOY
PRAGER, M. /N. AM. AVIATION/ DATE- FEB. 1968
M-FS-12410

Tests demonstrate the room temperature ductility of degraded Rene 41 can be increased to acceptable values by solution heat treatment at a temperature of 2050 degrees to 2150 degrees F/1 to 2 hours/ and cooling through a controlled temperature range followed by normal aging in air /16 hours at 1400 degrees F/.

B68-10031 PANELIZED HIGH PERFORMANCE MULTILAYER INSULATION

BURKLEY, R. A. SHRIVER, C. B. /GOODYEAR
AEROSPACE CORP./ STUCKEY, J. M. DATE- FEB. 1968
M-FS-14023

Multilayer insulation coverings with low conductivity foam spacers are interleaved with quarter mil aluminized polymer film radiation shields to cover flight type liquid hydrogen tankage of space vehicles with a removable, structurally compatible, lightweight, high performance cryogenic insulation capable of surviving extended space mission environments.

B68-10032 SURVEY MADE OF REFRACTORY METALS AULT, G. M. DATE- FEB. 1968 LEWIS-10380

Survey reviews the structural applications of refractory metals and the special problems they present in manufacture, evaluation, and application. The unique facilities required for their processing and evaluation, a summary of accomplishments in achieving commercial products, and the present status of the most advanced refractory materials are presented.

B68-10034
CONTINUOUS DETONATION REACTION ENGINE
LANGE, O. H. STEIN, R. J. TUBBS, H. E. DATEFEB. 1968
M-FS-14019

Reaction engine operates on the principles of a controlled condensed detonation rather than on the principles of gas expansion. The detonation results in reaction products that are expelled at a much higher velocity.

B68-10043 CURE OF EPOXY RESINS DETERMINED BY SIMPLE TESTS

LADAKI, M. NIGH, W. G. /N. AM. AVIATION/ DATE-FEB. 1968

M-FS-13131 M-FS-13132

Rapid visual and simple quantitative tests indicate the degree of cure of particular epoxy resin binders in prepreg stock. It is possible that these tests may be extended to a number of different epoxy formulations.

B68-10046
SURVEY OF FRACTURE TOUGHNESS TEST METHODS
BROWN, W. F., JR. JONES, M. H. SRAWLEY, J. E.
DATE- MAR. 1968 SEE ALSO NASA-TN-D-2599
AND ASTM-NASA-STP-410
LEWIS-10379

Comprehensive survey presents current methods of fracture toughness testing that are based on linear elastic fracture mechanics. General principles of the basic two dimensional crack stress field model are discussed in relation to real three dimensional specimens. Methods of

test instrumentation and procedure are described.

B68-10048
SIMPLE TEST FOR PHYSICAL STABILITY OF
CRYOGENIC TANK INSULATION
ROSSELLO, D. /DOUGLAS AIRCRAFT CO./ DATE- MAR.
1968
M-FS-12547

Qualitative test determines the ability of insulation liners used on liquid hydrogen tanks to withstand stresses produced by the thermal shocks imparted to the insulation during tank filling and drainage. Test specimens are bonded to metal plates with a low thermal expansion coefficient and are immersed in liquid hydrogen.

B68-10049
METHOD OF MAINTAINING ACTIVITY OF
HYDROGEN-SENSING PLATINUM ELECTRODE
HARMAN, J. N., III /BECKMAN INSTR./ DATE- MAR.
1968
M-FS-1422

Three-electrode hydrogen sensor containing a platinum electrode maintained in a highly catalytic state, operates with a minimal response time and maximal sensitivity to the hydrogen gas being sensed. Electronic control and readout circuitry reactivates the working electrode of the sensor to a state of maximal catalytic activity.

B68-10062
PYROTECHNIC DEVICE PROVIDES ONE-SHOT
HEAT SOURCE
HALLER, H. C. LALLI, V. R. /TRW EQUIPMENT LABS./
DATE- MAR. 1968
LEWIS-10131

Pyrotechnic heater provides a one-shot heat source capable of creating a predetermined temperature around sealed packages. It is composed of a blend of an active chemical element and another compound which reacts exothermically when ignited and produces fixed quantities of heat.

B68-10066
STATIC STRUCTURAL ANALYSIS OF SHELL-TYPE
STRUCTURES
BAKER, E. H. CAPPELLI, A. P. KOVALEVSKY, L.
RISH, F. L. VERRETTE, R. M. /N. AM. AVIATION/
DATE- MAR. 1968 SEE ALSO NASA-CR-912
MSC-11555

2-11555
Shell analysis manual provides methods for determining static deflections and internal load and stress distributions in shells under various loading conditions, and methods of analyzing static instability of shell structures. Also included are methods for determining the lightest shell wall for various constructions.

B68-10085
REINFORCED THERMAL-SHOCK RESISTANT CERAMICS
CRUMP, D. N. /THOMPSON RAMO WOOLDRIDGE/ DATEMAY 1968
LEWIS-10376

Composite material, made by dispersing short tungsten-rhenium fibers randomly throughout zirconium oxide, is highly resistant to oxidizing environments at temperatures above 2000 degrees F. This reinforced ceramic is also thermal stress resistant.

B68-10092
MOLDING A HIGH-DENSITY LAMINATE
HARAWAY, W. M. HEIER, W. C. KING, C. B. DATEMAR. 1968
LANGLEY-10051

Molding press is used to form phenolic resin impregnated glass fiber cloth into a high-density, cylindrical-ring laminate. The press applies clamping pressure and heat to a mold containing the glass fiber cloth laminate, which has hydrostatic pressure applied to it by means of a specially designed pressure plug.

B68-10094
HIGH STRENGTH NICKEL-BASE ALLOY WITH
IMPROVED OXIDATION RESISTANCE UP TO 2200
DEGREES F
FRECHE, J. C. WATERS, W. J. DATE- APR. 1968
LEWIS-10115

Modifying the chemistry of the NASA TAZ-8 alloy and utilizing vacuum melting techniques provides a high strength, workable nickel base \*\*superalloy\*\* with improved oxidation resistance for use up to 2200 degrees F.

B68-10095
COBALT-TUNGSTEN, FERROMAGNETIC
HIGH-TEMPERATURE ALLOY
ASHBROOK, R. L. DRESHFIELD, R. L. FRECHE, J. C.
HOFFMAN, A. C. SANDROCK, G. D. DATE- APR. 1968
SEE ALSO NASA-TN-D-4338
LEWIS-10378

Cobalt-base alloy which combines high temperature strength and magnetic properties has a composition in weight percent of 7-1/2 tungsten, 2-1/2 iron, 1 titanium, 1/2 zirconium, 1/2 carbon, and the balance cobalt. It may be used as construction material for electric motors and generators operating at high temperatures.

B68-10101
REACTION RATES OF GRAPHITE WITH OZONE
MEASURED BY ETCH DECORATION
HENNIG, G. R. MONTET, G. L. DATE- APR. 1968
ARG-10086

Etch-decoration technique of detecting vacancies in graphite has been used to determine the reaction rates of graphite with ozone in the directions parallel and perpendicular to the layer planes. It consists essentially of peeling single atom layers off graphite crystals without affecting the remainder of the crystal.

B68-10102
ANALYTICAL TECHNIQUES FOR DETERMINING BORON
IN GRAPHITE
HENNIG, G. R. MONTET, G. L. DATE- APR. 1968
ARG-10087

Two analytical techniques, a gold nucleation and an etch-decoration technique have been developed for determining the presence and mobility of boron in graphite.

B68-10103
GLASSY MATERIALS INVESTIGATED FOR NUCLEAR REACTOR APPLICATIONS
LYNCH, E. D. DATE- APR. 1968 SEE ALSO
ANL-7062
ARG-10075

Studies determine the feasibility of preparing fuel-bearing glasses and glasses bearing neutron-absorbing materials for use as crystalline fuel and control rods for reactors. Properties investigated were devitrification resistance, urania solubility, and density.

B68-10104
DECOMPOSITION VESSEL
BERNAS, B. /NATL. ACAD. OF SCI./ DATE- MAR. 1968
GSFC-10343

Stainless steel crucible-shaped vessel permits rapid decomposition of silicates and other refractory compounds by acids at relatively low temperatures. The vessel is lined with tetrafluoroethylene fluorocarbon resin and sealed by a sheet of the same material retained in a stainless steel screw cap.

B68-10105
BLAST DEFLECTOR TRAPS SMOKE AND DEBRIS FROM
EXPLOSIVE TRAINS
WILKOWSKI, J. C. /N. AM. AVIATION/ DATE- MAR.
1968
MSC-11241

--11241 Blast deflector protects interior areas and personnel from the smoke and debris of explosive trains. It contains open-cell foam to absorb the pressure loads generated by explosive charges and control the smoke and debris.

B68-10109
TUNGSTEN-RHENIUM ALLOY THERMOCOUPLES
EFFECTIVE FOR HIGH-TEMPERATURE MEASUREMENT
BROOKS, E. J. KRAMER, W. C. DATE- APR. 1968
SEE ALSO ANL-6981
ARG-10059

Tungsten-rhenium alloy thermocouples, specifically, insulated, sheathed W/W plus 26Re

and W plus 5Re/W plus 26Re thermocouples, are effective for temperature measurement in excess of 2920 degrees C. These thermocouples have a high thermoelectric output and excellent relationship to temperatures up to 2750 degrees C.

B68-10142
DEVICE PROVIDES CONTROLLED GAS LEAKS
KAMI, S. K. KING, H. J. /HUGHES AIRCRAFT CO./
DATE- APR. 1968
NPO-10298

Modified palladium leak device provides a controlled release /leak/ of very small quantities of gas at low or medium pressures. It has no moving parts, requires less than 5 watts to operate, and is capable of releasing the gas either continuously or in pulses at adjustable flow rates.

B68-10146
LAMINATED SHEET COMPOSITES REINFORCED WITH
MODULAR FILAMENT SHEET
REECE, 0. Y. DATE- MAY 1968
M-FS-14575

Aluminum and magnesium composite sheet laminates reinforced with low density, high strength modular filament sheets are produced by diffusion bonding and explosive bonding. Both processes are accomplished in normal atmosphere and require no special tooling or cleaning other than wire brushing the metal surfaces just prior to laminating.

B68-10153
STUDY OF CRACK INITIATION PHENOMENA
ASSOCIATED WITH STRESS CORROSION OF
ALUMINUM ALLOYS
HUNTER, M. S. /ALUMINUM CO. OF AM./ DATE- MAY
1968
M-FS-14283

Study of stress corrosion cracks in aluminum alloys reveals that crack initiation is greatly influenced by boundary orientation and directionality of the structure. In all crack susceptible materials, intergranular corrosion and stress corrosion cracking started and progressed in boundaries oriented perpendicularly to the stressing direction.

B68-10167
EVALUATION OF IGNITION MECHANISMS IN
SELECTED NONMETALLIC MATERIALS
GERSTEIN, M. MC LAIN, M. ROSS, W. /DYN. SCI.
CORP./ DATE- MAY 1968
MSC-11645 MSC-11646

MSC-11645 MSC-11647

Test program evaluates thermal and electric ignition mechanisms in selected nonmetallic materials found in spacecraft with concentrated oxygen atmospheres. The phenomena evaluated were spontaneous ignition, ignition of flammable vapor by a spark, and ignition by an arc where the arc produces the combustible vapor and the ignition source.

B68-10172
STUDY REVEALS EFFECT OF ALUMINUM ON
SATURATION MOMENT OF FE-NI ALLOYS
ALDRED, A. T. BARDOS, D. I. BECK, P. A.
/ILLINDIS UNIV./ DATE- MAY 1968
ARG-90259

Study of saturation magnetization, important in the investigation of the electronic structure of alloys, reveals the effect of aluminum on the saturation moments of iron-nickel alloys. The saturation magnetizations were extrapolated to the absolute zero of temperature for calculating average atomic moments.

B68-10177
SARAN FILM IS FIRE-RETARDANT IN OXYGEN
ATMOSPHERE
GOODWIN, J. T. HERRERA, W. R. /SOUTHWEST RES.
INST./ DATE- JUN. 1968
MSC-11604
Saran was tested for flammability as a wrapping on

Saran was tested for flammability as a wrapping on TFE-insulated electrical wire bundles in oxygen gas at pressures of 7.5 psia and 14.7 psia. It was found to be fire retardant or self-extinguishing in most instances. B68-10184 STRESS-CORROSION CHARACTERISTICS OF ALUMINUM CASTING ALLOY M-45 LOVOY, C. V. DATE- JUN. 1968 SEE ALSO B65-10092 AND B67-10159 M-FS-14817

Evaluation of the stress-corrosion characteristics of aluminum alloy M-45 shows that the most favorable artificial aging cycle for this alloy, with regard to optimum strength and stress-corrosion resistance, appears to be 400 degrees F for 12 hours.

B68-10189
REACTION STUDIED OF STEAM WITH NIOBIUM AND TANTALUM
KILPATRICK, M. LOTT, S. K. DATE- JUN. 1968
ARG-10051

Study reveals the kinetics of niobium and tantalum with steam at elevated temperatures to determine the suitability of high melting metals for fabrication of equipment for temperature steam environments. Niobium obeyed linear kinetics from 1050 degrees to 1500 degrees C but tantalum followed a paralinear raw law.

B68-10191 EVALUATION OF METHODS FOR NONDESTRUCTIVE TESTING OF BRAZED JOINTS KANNO, A. DATE- JUN. 1968 SEE ALSO ANL-6924 ARG-90175

Evaluation of nondestructive methods of testing brazed joints reveals that ultrasonic testing is effective in the detection of nonbonds in diffusion bonded samples. Radiography provides excellent resolutions of void or inclusion defects, and the neutron radiographic technique shows particular advantage for brazing materials containing cadmium.

B68-10192
WELDING OF COMMERCIAL BASE PLATES IS
INVESTIGATED
CHEEVER, D. L. MARTIN, D. C. MISHLER, H. W.
MONROE, R. E. /BATTELLE MEM. INST./ DATE- JUN.
1968
M-FS-13649

Investigation of aluminum alloy welds reveals that the combinations of metallic elements with hydrogen are not capable of producing weld porosity themselves, rather they tend to increase the amount of porosity only in the presence of arc contamination by water vapor.

B68-10194
SUSCEPTIBILITY OF IRRADIATED STEELS TO HYDROGEN EMBRITTLEMENT
ROSSIN, A. D. DATE- JUN. 1968 SEE ALSO ANL-7266
ARG-10115

Investigation determined whether irradiated pressure-vessel steels 4340 and 212-B are susceptible to hydrogen embrittlement and to catastrophic failure. Hydrogen-charging conditions which completely embrittled 4340 steel had negligible effect on 212-B steel in tensile and delayed-failure tests.

B68-10195
ELEMENTARY REVIEW OF ELECTRON MICROPROBE
TECHNIQUES AND CORRECTION REQUIREMENTS
HART, R. K. DATE- JUN. 1968 SEE ALSO
ANL-7078
ARG-10062

Report contains requirements for correction of instrumented data on the chemical composition of a specimen, obtained by electron microprobe analysis. A condensed review of electron microprobe techniques is presented, including background material for obtaining X ray intensity data corrections and absorption, atomic number, and fluorescence corrections.

B68-10196
FUNDAMENTAL ELECTRODE KINETICS
ELDER, J. P. DATE- JUN. 1968 SEE ALSO
ANL-7072
ARG-10067

Report presents the fundamentals of electrode kinetics and the methods used in evaluating the characteristic parameters of rapid-charge transfer processes at electrode-electrolyte interfaces. The concept of electrode kinetics is outlined, followed by the principles underlying the experimental techniques for the investigation of electrode kinetics.

B68-10197
STUDY OF MECHANICAL PROPERTIES OF URANIUM COMPOUNDS
BEALS, R. J. DRAGEL, G. M. HANDWERK, J. H. TOTTLE, C. R. DATE- JUN. 1968 SEE ALSO ANL-7070
ARG-10074

Study determines the mechanical properties, including brittleness and ductility of several uranium compounds. These include uranium dioxide, uranium sulfide, and uranium phosphide.

B68-10198
CRYSTAL STRUCTURE ANALYSIS OF INTERMETALLIC
COMPOUNDS
CONNER, R. A., JR. DOWNEY, J. W. DWIGHT, A. E.
DATE- JUN. 1968
ARG-10092

Study concerns crystal structures and lattice parameters for a number of new intermetallic compounds. Crystal structure data have been collected on equiatomic compounds, formed between an element of the Sc, Ti, V, or Cr group and an element of the Co or Ni group. The data, obtained by conventional methods, are presented in an easily usable tabular form.

B68-10199
STUDIES IN ZIRCONIUM OXIDATION
DRALEY, J. E. DRUNEN, C. J. LEVITAN, J. DATEJUN. 1968 SEE ALSO ANL-7252
ARG-10099

S-10099
Study provides insight into the oxidation mechanism of zirconium by combining electrical measurements with oxidation data. The measurement of electrical potential across growing scale on zirconium and the determination of conventional weight-change oxidation data were carried out at 550, 700, and 800 degrees C.

B68-10200
RESISTIVITY MEASUREMENTS OF NEUTRON-IRRADIATED
PURE METALS AND AL-ZN ALLOYS
HORAK, J. A. DATE- JUN. 1968 SEE ALSO
ANL-7185
ARG-10108

Report presents resistivity measurements and their interpretation for neutron-irradiated pure metals and Al-Zn alloys. The influence of temperature, the role of point defects, and the aging behavior on resistivity are considered. The experimental procedures and results are discussed in detail.

B68-10201
TECHNOLOGICAL SURVEY OF TELLURIUM AND ITS
COMPOUNDS
STEINDLER, M. J. VISSERS, D. R. DATE- JUN. 1968
SEE ALSO ANL-7142
ARG-10119

Review includes data on the chemical and physical properties of tellurium, its oxides, and fluorides, pertinent to the process problem of handling fission product tellurium in fluoride form. The technology of tellurium handling in nonaqueous processing of nuclear fuels is also reviewed.

B68-10204
MANGANESE-ALUMINA-CERAMIC GLASS ELIMINATES
RIGID CONTROLS NECESSARY IN BONDING METALS
TO CERAMICS
HOLLAR, E. L. DATE- JUN. 1968
SAN-10012

Matrix of manganese-alumino-silicate glass simplifies the processes of metallizing alumina ceramics. Because the manganese in the glass is preoxidized to the 2 plus state by firing in nitrogen, the ceramic can be metallized in dry hydrogen. Lengthening the firing time permits a

lower metallizing temperature.

B68-10212
ION PLATING TECHNIQUE IMPROVES THIN FILM DEPOSITION
MATTOX, D. M. DATE- JUN. 1968
SAN-10006

Ion plating technique keeps the substrate surface clean until the film is deposited, allows extensive diffusion and chemical reaction, and joins insoluble or incompatible materials. The technique involves the deposition of ions on the substrate surface while it is being bombarded with inert das ions.

B68-10214
REDUCING BUBBLES IN GLASS COATINGS IMPROVES
ELECTRICAL BREAKDOWN STRENGTH
BANKS, B. DATE- JUN. 1968
LEWIS-10278

WIS-10278

Helium reduces bubbles in glass coatings of accelerator grids for ion thrustors. Fusing the coating in a helium atmosphere creates helium bubbles in the glass. In an argon atmosphere, entrapped helium diffuses out of the glass and the bubbles collapse. The resultant coating has a substantially enhanced electrical breakdown strength.

B68-10215
GLASS COATED SINGLE GRID FOR CHARGED
PARTICLE ACCELERATION
BANKS, B. A. NAKANISHI, S. DATE- JUN. 1968
LEWIS-10106

Glass coating is used on a single grid accelerator system for ion thrusters. The uniformly thin, smooth, dense, impervious glass coating has a high dielectric strength and is firmly bonded to the accelerator grid.

B68-10221
LIQUID CRYSTAL CALIBRATOR
COHEN, S. E. /LOCKHEED-GEORGIA CO./ DATE- JUN.
1968
M-FS-14151

FS-141b1
Calibration apparatus determines the operating temperature range /sensitivity/ of liquid crystals. The calibrator maintains a precisely controlled test surface temperature. It permits a measurement accuracy of plus or minus 0.5 degrees F and a sensitivity of plus or minus 0.15 degrees F.

WELD MICROFISSURING IN INCONEL 718
MINIMIZED BY MINOR ELEMENTS
MORRISON, T. J. SHIRA, C. S. WEISENBERG, L. A.
/N. AM. ROCKWELL CORP./ DATE- JUL. 1968
SEE ALSO B67-10049
M-FS-18185

S-1818b
Manganese, silicon, and magnesium markedly reduce
the tendency of Inconel 718 to weld
microfissuring. By combining a manganese, 0.20
percent by content, with silicon, greater than
0.25 percent content, or by adding 20 ppm of
magnesium, the weld microfissuring decreased in
the standard alloy.

HIGH TEMPERATURE ALLOY
FRANK, R. G. SEMMEL, J. W., JR. /GE/ DATE- JUL.
1968
LEWIS-10377

B68-10253

Molybdenum is substituted for tungsten on an atomic basis in a cobalt-based alloy, S-1, thus enabling the alloy to be formed into various mill products, such as tubing and steels. The alloy is weldable, has good high temperature strength and is not subject to embrittlement produced by high temperature aging.

B68-10256
GRAPHITE CLOTH FACILITATES VACUUM
EVAPORATION OF SILICON MONOXIDE
CARITHERS, M. D. /GEORGIA INST. OF TECH./ DATEJUL. 1968
M-FS-14764

Woven graphite cloth facilitates the vacuum deposition of thin films of silicon monoxide on

substrate surfaces. The cloth serves both as a container and electric heating element for the silicon monoxide. It minimizes and prevents the silicon monoxide particle ejection, provides uniform heat distribution, and cools rapidly by radiation.

B68-10271
PREPARATION OF SILVER-ACTIVATED ZINC SULFIDE
THIN FILMS
FELDMAN, C. SWINDELLS, F. E. /MELPAR/ DATEAUG. 1968
GSFC-10687

Silver improves luminescence and reduces contamination of zinc sulfide phosphors. The silver is added after the zinc sulfide phosphors are deposited in thin films by vapor evaporation, but before calcining, by immersion in a solution of silver salt.

B68-10274
VISCOSITY AND DENSITY OF METHANOL/WATER
MIXTURES AT LOW TEMPERATURES
AUSTIN, J. G. KURATA, F. SWIFT, G. W. /KANSAS
UNIV./ DATE- AUG. 1968
M-FS-14991

Viscosity and density are measured at low temperatures for three methanol/water mixtures. Viscosity is determined by a modified falling cylinder method or a calibrated viscometer. Density is determined by the volume of each mixture contained in a calibrated glass cell placed in a constant-temperature bath.

B68-10278 CHARACTERISTICS OF FLUIDIZED-PACKED BEDS GABOR, J. D. MECHAM, W. J. DATE- AUG. 1968 SEE ALSO ANL-6859 ARG-10049

Study of fluidized-packed bed includes
investigation of heat transfer, solids-gas mixing,
and elutriation characteristics. A
fluidized-packed bed is a system involving the
fluidization of small particles in the voids of a
packed bed of larger nonfluidized particles.

B68-10279
100 ANGSTROM NIOBIUM WIRE
CLINE, H. E. ROSE, R. M. WULFF, J. /MIT/
LEWIS-10128

Composite of fine niobium wires in copper is used to study the size and proximity effects of a superconductor in a normal matrix. The niobium rod was drawn to a 100 angstrom diameter wire on a copper tubing.

B68-10281 STUDY OF BEHAVIOR OF STEROLS AT INTERFACES KLEIN, P. D. KNIGHT, J. C. SZCZEPANIK, P. A. DATE- AUG. 1968 ARG-10085

Behavior of sterols and sterol acetates on various types of interfaces indicates that the function of a sterol depends upon a surface orientation and surface energy of the interface.

Column-chromatographic techniques determine the retention volume of various sterols under standard conditions.

B68-10285
PRE-WELD HEAT TREATMENT IMPROVES WELDS IN
RENE 41
PRAGER, M. /N. AM. ROCKWELL CORP./ DATE- AUG.
1968
M-FS-18174

Cooling of Rene 41 prior to welding reduces the incidence of cracking during post-weld heat treatment. The microstructure formed during the slow cooling rate favors elevated temperature ductility. Some vestiges of this microstructure are apparently retained during welding and thus enhance strain-age crack resistance in air.

B68-10302
EFFECTS OF SURFACE PREPARATION ON QUALITY
OF ALUMINUM ALLOY WELDMENTS
KIZER, D. SAPERSTEIN, Z. /IIT RES. INST./ DATEAUG. 1968
M-FS-13152

Study of surface preparations and surface contamination effects on the welding of 2014 aluminum involves several methods of surface analysis to identify surface properties conducive to weld defects. These methods are radioactive evaporation, spectral reflectance mass spectroscopy, gas chromatography and spark emission spectroscopy.

B68-10334
MICROPROBE INVESTIGATION OF BRITTLE
SEGRECATES IN ALUMINUM MIG AND TIG WELDS
LARSSEN, P. A. MILLER, E. L. /MCDONNELL DOUGLAS
CORP./ DATE- SEP. 1968
M-FS-14720

FS-14720

Quantitative microprobe analysis of segregated particles in aluminum MIG /Metal Inert Gas/ and TIG /Tungsten Inert Gas/ welds indicated that there were about ten different kinds of particles, corresponding to ten different intermetallic compounds. Differences between MIG and TIG welds related to the individual cooling rates of these welds.

B68-10340
APPLICATION OF THE SOLID LUBRICANT
MOLYBDENUM DISULFIDE BY SPUTTERING
PRZYBYSZEWSKI, J. SPALVINS, T. DATE- SEP. 1968
LEWIS-10544

MIS-10544

Molybdenum disulfide lubricant film is deposited on two substrates, niobium and nickel-chromium alloys, by means of physical direct-current sputtering. The sputtering system uses a three-electrode /triode/ geometry - a thermionic cathode, an anode, and the target, all enclosed in a vacuum chamber.

B68-10344
NICKEL BASE ALLOY WITH IMPROVED STRESS
RUPTURE PROPERTIES
COLLINS, H. E. QUIGG, R. J. /TRW/ DATE- SEP.
1968
LEWIS-10283

Nickel base superalloy with improved stress rupture properties is used for jet aircraft turbine blades. This alloy is capable of maintaining its strength and its creep, oxidation, and thermal fatigue resistance at high temperature.

B68-10351
THERMAL CONDUCTIVITY AND DIELECTRIC CONSTANT
OF SILICATE MATERIALS
SIMON, I. WECHSLER, A. E. /ARTHUR D. LITTLE,
INC./ DATE- SEP. 1968
M-FS-14856

Report on the thermal conductivity and dielectric constant of nonmetallic materials evaluates the mechanisms of heat transfer in evacuated silicate powders and establishes the complex dielectric constant of these materials. Experimental measurements and results are related to postulated lunar surface materials.

B68-10355
EXPERIMENTS WITH CERAMIC COATINGS
LYNN, E. K. ROLLINS, C. T. /N. AM. ROCKWELL
CORP./ DATE- SEP. 1968
M-FS-18150

Report describes the procedures and techniques used in the application of a ceramic coating and the evaluation of test parts through observation of the cracks that occur in this coating due to loading.

B68-10358
FIRE RETARDANT FOAMS DEVELOPED TO SUPPRESS
FUEL FIRES
FISH, R. GILWEE, W. J. PARKER, J. A.
RICCITIELLO, S. R. DATE- SEP. 1968
ARC-10098

--10198 Heat insulating polyurethane foam retards and suppresses fuel fires. Uniformly dispersed in the foam is a halogenated polymer capable of splitting off hydrogen halide upon heating and charring of the polyurethane.

B68-10360 Fiberglass-reinforced structural materials FOR AEROSPACE APPLICATION BARTLETT, D. H./BOEING CO./ DATE- SEP. 1968 M-FS-14806

Evaluation of fiberglass-reinforced plastic materials concludes that fiberglass construction is lighter than aluminum alloy construction. Low thermal conductivity and strength makes the fiberglass material useful in cryogenic tank supports.

B68-10368
CONSOLIDATION AND FABRICATION TECHNIQUES
FOR VANADIUM-20 W/O TITANIUM /TV-20/
BURT, W. R. KARASEK, F. J. KRAMER, W. C.
MAYFIELD, R. M. MC GOWAN, R. D. DATE- OCT. 1968
SEE ALSO ANL-7127 AND ANL-6928
ARG-10148

3-10148
Tests of the mechanical properties, fuel compatibility, sodium corrosion and irradiation behavior were made for vanadium and vanadium alloy. Improved methods for consolidation and fabrication of bar, rod, sheet, and high-quality, small diameter, thin-wall tubing of vanadium-20 without titanium are reported.

B68-10369
TUNGSTEN FIBER-REINFORCED NICKEL SUPERALLOY
PETRASEK, D. W. SIGMORELLI, R. A. WEETON, J. W.
DATE- OCT. 1968 SEE ALSO NASA-TN-D-4787
AND NASA-TM-X-52342
LEWIS-10424

Tungsten fiber-reinforced nickel superalloy combines the strength of refractory metals with the oxidation resistance of superalloys. Knowledge of the relationship between fabrication technique, matrix compositions and fiber sizes minimized fiber-matrix reaction. Potential application includes high temperature turbine components.

B68-10373
PRODUCT IDENTIFICATION TECHNIQUES USED AS TRAINING AIDS FOR ANALYTICAL CHEMISTS GRILLO, J. P. DATE- OCT. 1968
SAN-10025

Laboratory staff assistants are trained to use data and observations of routine product analyses performed by experienced analytical chemists when analyzing compounds for potential toxic hazards. Commercial products are used as examples in teaching the analytical approach to unknowns.

B68-10378
NONDESTRUCTIVE METHOD FOR MEASURING RESIDUAL
STRESSES IN METALS, A CONCEPT
SCHWEBEL, C. D. /BOEING CO./ DATE- OCT. 1968
KSC-10237

Nondestructive direct measurement of residual surface stresses in metals can be made because metal under stress has a different electrochemical solution potential than in the unstressed condition. The method uses two matched electrolytic cells to cancel extraneous effects on the actual solution potential of the metal specimen.

B68-10380
NICKEL-BASE SUPERALLOY\*S EXCELLENT
PROPERTIES PROMOTE ITS SERVICE TO 2200
DEGREES F
FRECHE, J. C. WATERS, W. J. DATE- OCT. 1968
SEE ALSO NASA-TN-D-4390, B66-10222, AND
B68-10094
LEWIS-10355

Nickel base alloy with high strength, ductility, Mickel base alloy with high strength, ductility, good impact and oxidation resistance, microstructural stability, workability potential, and the ability to show improved strength and ductility when directly solidified has recently been developed for high temperature applications.

B68-10381
HIGH-EMITTANCE COATINGS ON METAL SUBSTRATES
EMANUELSON, R. C. LUOMA, W. L. WALEK, W. J.
/PRATT AND WHITNEY AIRCRAFT CORP./ DATE- OCT.
1968
LEWIS-10325

High-emittance coatings of iron, calcium, and

zirconium titanates thermally sprayed on stainless steel, columbium-1 percent zirconium, and beryllium substrates promote and control radiative heat transfer from the metal substrates. Adherence, compatibility and emittance stability at elevated temperature and high vacuum were evaluated.

B68-10385

ELECTROMOTIVE SERIES ESTABLISHED FOR METALS USED IN AEROSPACE TECHNOLOGY
KUSTER, C. A. /N. AM. ROCKWELL CORP./ DATE- OCT. 1968

M-FS-18327

Electromotive series has been established for approximately 130 commonly used aerospace metals. For most metals an initial potential and a service related potential was obtained.

B68-10390

IMPROVED PROCESS FOR EPITAXIAL DEPOSITION OF SILICON ON PREDIFFUSED SUBSTRATES
CLARKE, M. G. HALSOR, J. L. WORD, J. C.
/WESTINGHOUSE ELEC. CORP./ DATE- OCT. 1968

Process for fabricating integrated circuits uniformly deposits silicon epitaxially on prediffused substrates without affecting the prediffused substrates without affecting the sublayer diffusion pattern. Two silicon deposits from different sources, and deposited at different temperatures, protect the sublayer pattern from the silicon tetrachloride reaction.

B68-10391

TRAINING MANUALS FOR NONDESTRUCTIVE TESTING USING MAGNETIC PARTICLES
INNOVATOR NOT GIVEN /GEN. DYN./CONVAIR/ DATE- OCT. 1968 M-FS-20187

Training manuals containing the fundamentals of nondestructive testing using magnetic particle as detection media are used by metal parts inspectors and quality assurance specialists. Magnetic particle testing involves magnetization of the test specimen, application of the magnetic particle and interpretation of the patterns formed.

B68-10392 CONTAMINATION CONTROL HANDBOOK INNOVATOR NOT GIVEN /SANDIA CORP./ DATE-M-FS-20185

FS-20185
Contamination Control Handbook provides
technical information on avoiding contamination of
physical, chemical or biological systems or
products. The book includes control methods for
product design, gases and liquids, airborne and
surface contamination, radiation, packaging,
handling, storage and personal. handling, storage and personnel.

NONDESTRUCTIVE TESTING OF BRAZED ROCKET ENGINE COMPONENTS

ADAMS, C. J. HAGEMAIER, D. J. MEYER, J. A. /N. AM. ROCKWELL CORP./ DATE- OCT. 1968 M-FS-18191

Report details study made of nondestructive aport details study made of nondestructive radiographic, ultrasonic, thermographic, and leak test methods used to inspect and evaluate the quality of the various brazed joints in liquid-propellant rocket engine components and assemblies. Descriptions of some of the unique equipment and methods developed are included.

THE THERMODYNAMIC PROPERTIES OF THE WUSTITE

THE THERMODYNAMIC PROPERTIES OF THE WUSTITE PHASE ARE STUDIED ACKERMAN, R. J. SANDFORD, R. W., JR. DATE- DEC. 1968 SEE ALSO ANL-7250 ARG-10200

Study of the precise location of the wustite phase boundaries and the dependence of the partial pressure of oxygen on the temperature and composition of the solid phase was made. From the pressure of oxygen, the temperature and the composition thermodynamic quantities can be determined.

B68-10409 THE PREPARATION, IDENTIFICATION AND PROPERTIES OF CHLOROPHYLL DERIVATIVES KATZ, J. J. PENNINGTON, F. C. STRAIN, H. H. SVEC, W. A. DATE- DEC. 1968 ARG-10205

In the investigation of 10-hydroxy chlorophylls a and b novel techniques included modification of and b novel techniques included modification of chromatography and the use of fully-deuterated compounds isolated from fully-deuterated autotropic algae to determine the molecular structure of the chlorophylls.

B68-10414 TITANIUM-NITROGEN REACTION INVESTIGATED FOR

APPLICATION TO GETTERING SYSTEMS
ARNTZEN, J. D. COLEMAN, L. F. KYLE, M. L.
PIERCE, R. D. DATE- NOV. 1968 SEE ALSO ANL-7167

ARG-10208

Titanium is one of several gettering materials itanium is one of several gettering materials available for removing nitrogen from inert gases. The reaction rate of titanium-metal sponge and nitrogen in argon-nitrogen mixtures was studied at 900 degrees C. The rate was found to depend upon the partial pressure of nitrogen in the gas phase. Mathematical relationships simulate titanium susteme. titanium systems.

B68-10419 CHEMISTRY LABORATORY SAFETY MANUAL AVAILABLE

ELSBROCK, R. G. DATE- NOV. 1968 SAN-10030

Chemistry laboratory safety manual outlines safe practices for handling hazardous chemicals and chemistry laboratory equipment. Included are discussions of chemical hazards relating to fire, health, explosion, safety equipment and procedures for certain laboratory techniques and manipulations involving glassware, vacuum equipment, acids, bases, and volatile solvents.

B68-10425

NITRIC ACID-ORGANIC MIXTURES SURVEYED FOR USE IN SEPARATION BY ANION EXCHANGE METHODS BLOOMQUIST, C. A. A. FARIS, J. P. STEWART, D. C. DATE- NOV. 1968 SEE ALSO ANL-6999 ARG-10065

Column elution-spectrographic analysis technique plumn elution-spectrographic analysis technique compares certain solvents directly to the methanol system, using inert rare earths instead of actinides. Distribution ratios for americium between 90 percent solvent, 10 percent 5 M nitric acid and Dowex 1 nitrate form resin for a large group of organics miscrible in water was determined.

AN ECONOMICAL METHOD FOR THE CONTINUOUS
PRODUCTION OF IODINE-123
BLUE, J. W. SMITH, W. R. SODD, V. J. DATE- DEC. 1968 LEWIS-10518

Simple and inexpensive method produces iodine-123, in a conventional cyclotron. Tellurium-122, a stable isotope available in enrichments exceeding 95 percent, is held on a porous metal plate by a flowing stream of helium and bombarded with either alpha particles or helium-3.

B68-10454 HYDROGEN PEROXIDE ETCHING PROVES USEFUL FOR GERMANIUM

DAYAL, Y. /IIT RES. INST./ PRIMAK, W. DATE- DEC. 1968 ARG-10170 KAMPWIRTH, R.

Influence of process variations in the etching of germanium with hydrogen peroxide has been studied, along with damage effects due to radiation. The work advances the knowledge of the etching process for germanium.

GRAIN-BOUNDARY MIGRATION IN KCL BICRYSTALS GIBBON, C. F. DATE- DEC. 1968 SEE ALSO ARG-10181

Boundary migration in melt-grown bicrystals of

KCl containing pure twist boundaries was investigated. The experiments involve the use of bicrystal specimens in the shape of right-triangular prisms with the boundary parallel to one side.

B68-10520
AMBIENT TEMPERATURE CATALYST FOR HYDROGEN
IGNITION
ROBERTS, R. W. /N. AM. ROCKWELL CORP./ DATENOV. 1968
LEWIS-10551

Low cost, ambient temperature catalyst for reacting hydrogen gas with air in a catalytic cell near the point of evolution at a controlled rate is announced.

B68-10522 METHOD FOR REMOVING SURFACE-DAMAGED LAYERS FROM NICKEL ALLOYS FAWLEY, R. W. /N. AM. ROCKWELL CORP./ DATE- NOV. 1968 M-FS-18151

Electrical discharge machining /EDM/ damaged layer can be effectively removed from Rene 41, Inconel 625, Inconel 718, and Monel K-500 by abrasive-grit blasting or electropolishing /at room temperature/ at a current density of 5A/inches squared in a water solution of phosphoric and sulfuric acids.

B68-10523
EVALUATION OF A FLUOROCARBON PLASTIC USED
IN CRYOGENIC VALVE SEALS
CIERNIAK, R. E. LIEB, J. H. MOWERS, R. E. /N.
AM. ROCKWELL CORP./ DATE- NOV. 1968
M-FS-18189

Effects of strain rate, temperature, crystallinity, and surface finish /smoothness/ on the tensile strength of a commercial chlorotrifluorethylene plastic /CTFE/ used for lipseals in very fast-acting liquid oxygen valves.

B68-10524
DISPENSING GRADUATE FOR BUTADIENE
HIRSHFIELD, S. M. /N. AM. ROCKWELL CORP./ DATENOV. 1968
NPO-10070

Graduate was designed for dispensing small volumes of liquid 1,3-butadiene or other volatile liquids which are in the gaseous state at room temperature.

B68-10526
PRECISE DOPING OF METALS BY SMALL GAS FLOWS
BARRETT, C. A. DATE- NOV. 1968
LEWIS-10444

Simple method was developed for doping refractory metals with oxygen. The metal specimens are heated in a dynamic high-vacuum system. The system can be used for other oxygen absorption processes /such as low-pressure oxidation measurements/ and for gases other than oxygen.

B68-10527
GRAIN GROWTH INHIBITOR FOR POROUS TUNGSTEN
MATERIALS
TORD H H /FIFCTRO-OPT SYSTEMS/ DATE-

TODD, H. H. /ELECTRO-OPT. SYSTEMS/ DATE- NOV. 1968 LEWIS-10535

Boron, either uncombined or combined with nitrogen or carbon added to tungsten powder prior to processing, effectively inhibits grain growth. The tungsten material is stable up to 1800 degrees C.

B68-10528
METHOD FOR CONTROLLING DENSITY AND
PERMEABILITY OF SINTERED POWDERED METALS
TODD, H. H. /ELECTRO-OPT. SYSTEMS/ DATE- NOV.
1968
LEWIS-10393

Improved, relatively low-cost method has been developed to produce porous metals with predetermined pore size, pore spacing, and density, utilizing powder-metal processes. The method uses angular not spherical tungsten powder.

B68-10532
MASS LOADING EFFECTS ON VIBRATED RING AND SHELL STRUCTURES
LEE, S. Y. /N. AM. ROCKWELL CORP./ DATE- NOV. 1968
M-FS-14979

Efficient methods for predicting the effects of attached masses on the vibration characteristics of ring and shell structures have been developed and substantiated with experimental data.

A RAPID STRESS-CORROSION TEST FOR ALUMINUM ALLOYS
HELFRICH, W. J. /KAISER ALUMINUM AND CHEM.
CORP./ DATE- DEC. 1968
M-FS-20175

Stressed alloy specimens are immersed in a salt-dichromate solution at 60 degrees C. Because of the minimal general corrosion of these alloys in this solution, stress corrosion failures are detected by low-power microscopic examination.

B68-10552 SIMULATED HAILSTONE FABRICATION AND USE IN TESTING WEATHERABILITY OF STRUCTURES STOLLER, F. W. DATE- DEC. 1968 NPO-10783

Equipment fabricates and uses simulated hailstones to test the weatherability of exposed structures. The equipment projects the hailstones at velocities experienced in hailstorms.

B68-10553 STRUCTURAL THERMAL-CONTROL COATINGS STOLLER, F. W. DATE- DEC. 1968 NPO-10785

Specifications have been formulated for application of thermal-control paints on large radar antenna structures exposed to solar radiation. The paint minimizes thermally induced mechanical deflections and glare of incident solar radiation.

B68-10557 SEPARATOR FOR ALKALINE BATTERIES HOYT, H. W. PFLUGER, H. L. /BORDEN CO./ DATE-DEC. 1968 GSFC-10173

Separator compositions have been tested as components of three-plate silver-zinc oxide cells in a standard cycling test. Six materials meet imposed requirements, giving cycling performance superior to cellophane.

B68-10561
WELD JOINT STRENGTH AND MECHANICAL PROPERTIES
IN 2219-T81 ALUMINUM ALLOY
KROPP, C. J. WITZELL, W. E. /GEN. DYN./CONVAIR/
DATE- DEC. 1968
LEWIS-10479

Plate and sheet were welded using automatic TIG /tungsten-inert gas/ weld techniques and manual repair weld techniques. Yield strength of 2219-T81 sheet and plate decreases significantly when welded.

B68-10568
STRESS-CORROSION-INDUCED PROPERTY CHANGES
IN ALUMINUM ALLOYS
BANKSTON, B. F. CLOTFELTER, W. N. DATE- DEC.
1968
M-FS-20209

Measurements of electrical conductivity, ultrasonic surface wave attenuation, and internal friction loss were made on aluminum alloys 7079-T6, 2219-T31, and 2219-T81 as a function of the onset of stress corrosion.

#### 04 LIFE SCIENCES

B68-10076
METABOLIC AND TOXICOLOGICAL EFFECTS OF
WATER-SOLUBLE XENON COMPOUNDS ARE STUDIED
FINKEL, A. J. KATZ, J. J. MILLER, C. E. DATEAPR. 1968

ARG-90239

ERC-10003

Biological properties of water-soluble xenon compounds are the moderate toxicity of these substances, their rapid decomposition in the body, the speed with which the xenate appeared to be reduced to xenon gas, and the very rapid elimination of this gas from the body.

B68-10169
RADIATION EFFECTS ON BACTERIAL CELLS
POWERS, E. L. DATE- JUN, 1968

Study reveals the physicochemical and biochemical mechanisms which alter or modify the effects of high-energy radiation on living cells. An in-depth discussion is presented emphasizing the importance of optimizing bacterial treatment with glycerol.

B68-10206
INFRARED VIEWING PERMITS HUMAN IRIS
RESPONSE STUDIES
SCHNASS, E. R. /N. AM. AVIATION/ DATE- JUN. 1968

Infrared image converter tube and a filtered light source monitor and measure the eye of a subject during experimental task-work operations to obtain a more natural measurement of unimpeded iris response. The device permits observation in the near infrared region, with little stimulation to the eye except by normal ambient lighting.

B68-10231 VACUUM PROBE SAMPLER REMOVES MICRON-SIZED PARTICLES FROM SURFACES WHITFIELD, W. J. DATE- JUL. 1968 SAN-10003

Vacuum probe sampler removes micron-sized particles from sensitive surfaces, without damage to the surface. The probe has a critical orifice to ensure an optimum airflow rate that disturbs the boundary layer of air and raises bacteria from the surface into the probe with the moving air stream.

B68-10320
EXPERIMENTAL STUDY AND EVALUATION OF RADIOPROTECTIVE DRUGS
SMITH, D. E. THOMSON, J. F. DATE- AUG. 1968
ARG-10196

Experimental study evaluates radioprotective drugs administered before exposure either orally or intravenously. Specifically studied are the sources of radiation, choice of radiation dose, choice of animals, administration of drugs, the toxicity of protective agents and types of protective drug.

B68-10324
FOOD PRODUCTS FOR SPACE APPLICATIONS
COPE, P. S. LARSON, R. W. /WHIRLPOOL CORP./
DATE- AUG. 1968
MSC-11697 MSC-11698 MSC-11699
Specially-prepared foodstuffs supply an as
with a diet containing his basic nutriti

Specially-prepared foodstuffs supply an astronaut with a diet containing his basic nutritional requirements in a form that is useful in his environment. Several edible coatings preserve foods and give \*\*loose\*\* foods form and firmness. These coatings aid in packaging and give the food \*\*slip\*\* for easy removal from the package.

B68-10366
STRATIFICATION OF CENTRIFUGED AMOEBA NUCLEI
INVESTIGATED BY ELECTRON MICROSCOPY
BREYER, E. P. DANIELS, E. W. DATE- OCT. 1968
ARG-10161

Study establishes a relationship between radioresistance and the nucleolar stratification characteristics of various amoeba species. Two species of fresh water amoeba are studied with the electron microscope. The report discusses the nature of nucleolar layers and their possible relationship to the differences in radiosensitivity of the two amoeba species.

B68-10424
RATE CONSTANTS MEASURED FOR HYDRATED ELECTRON REACTIONS WITH PEPTIDES AND PROTEINS

BRAAMS, R. DATE- NOV. 1968 ARG-10195

Effects of ionizing radiation on the amino acids of proteins and the reactivity of the protonated amino group depends upon the pK subscript a of the group. Estimates of the rate constants for reactions involving the amino acid side chains are presented. These rate constants gave an approximate rate constant for three different protein molecules.

B68-10427 COMPOUND EQUATION DEVELOPED FOR POSTNATAL GROWTH OF BIRDS AND MAMMALS LAIRD, A. K. DATE- NOV. 1968 ARG-10192

Compound growth equation was developed in which the rate of this linear growth process is regarded as proportional to the mass already attained at any instant by an underlying Gompertz process. This compound growth model was fitted to the growth data of a variety of birds and mammals of both sexes.

B68-10500 BIOLOGICAL ISOLATION GARMENT SPROSS, F. R. DATE- NOV. 1968 MSC-12206

Biological Isolation Garment /BIG/ is a one piece loose fitting garment fabricated from a tightly woven, permeable, 100 percent-cotton fabric. Its headpiece, incorporates an integral oronasal respirator with 0.3-micron- particle filters, and a full width visor. All fabrication seams are sealed on the inside of the garment.

B68-10554
A MICROLAGGON TECHNIQUE FOR THE CULTURE OF MAMMALIAN GELLS
CONE, C. D., JR. PEDDREW, K. H. DATE- DEC. 1968
LANGLEY-10407

Technique obtains micropartitioning in a simple and reproducible manner by forming a field of tiny ponds or lagoons on the surface of a suitable culturing vessel. The technique allows free access of the common culture to all parts of the field.

#### 05 MECHANICAL

B68-10004
DEVELOPMENT OF MECHANIZED ULTRASONIC
SCANNING SYSTEM
EVANS, R. MAC DONALD, J. A. DATE- JAN. 1968
SEE ALSO NASA-TM-X-53598
M-FS-13638

Mechanized ultrasonic scanning system inspects the flaw content in the welds of space vehicle booster stages and propellant tanks. It is capable of scanning welds at speeds greater than 1 inch per second.

B68-10011
PNEUMATIC RAFT AUTOMATICALLY REFORMS AFTER
RUPTURE OF BUOYANT MEMBER
RADNOFSKY, M. I. SHEWMAKE, G. A. DATE- JAN. 1968
MSC-11562

Unique, inflated, expandable socks are attached within the inflated chamber of a raft or a float in such a way that collapse of the chamber wall through damage, causes the adjacent sock to expand and restore the original configuration.

B68-10014
VENT AND RELIEF VALVE MAINTAINS LOW
LEAKAGE RATE OVER BROAD TEMPERATURE RANGE
WEITENBECK, R. G. /PARKER AIRCRAFT CO./ DATEJAN. 1968
M-FS-12807

Low leakage rate, large diameter vent and relief valve operates satisfactorily over a large temperature range by a design that accommodates waviness and distortions due to thermal gradients. It is based on a fixed sealing member having an inclined lapped surface to which a flexible flow gate conforms.

MECHANICAL SHIELDING REDUCES WELD SURFACE CRACKING IN 6061 T6 ALUMINUM HILL, J. E. /N. AM. AVIATION/ DATE- FEB. 1968 MSC-11494

Mechanical shield of high melting point material protects 6061-T6 aluminum welded with high frequency ac tungsten arc equipment. It is held in place around the weld bead area and eliminates

B68-10024
LOCATING AND SEALING AIR LEAKS IN
MULTIROUMED BUILDINGS
BRITTON, J. M. /AEROJET-GEN. CORP./ DATE- FEB.
1968
NUC-10304

Industrial, nontoxic smoke bombs are used in multiroomed buildings to locate and fill discovered leak areas with polyurethane foam. All obvious air escape routes are sealed and the room is then pressurized to a minimum of 0.1 inch water above the pressure of adjoining rooms.

B68-10026
PREDICTING FATIGUE LIFE OF METAL BELLOWS
DANIELS, C. M. /N. AM. AVIATION/ DATE- FEB. 1968
M-FS-14096

Classical method of presenting fatigue data in plots of alternating stress vs number of deflection cycles is applied to bellows formed of various metals, including corrosion-resistant steel, nickel alloys, and aluminum alloys. The expected life of a new bellows design can then be determined before fabrication and testing.

B68-10035 COMPUTER MAGNETIC TAPE REHABILITATION STUDY BYRD, V. H. DATE- FEB. 1968 GSFC-10283

Study determines the most efficient method for magnetic tapes rehabilitation and storage for reuse. Investigated were the physical changes taking place in the tape during the rehabilitation process, measure of quality of the processed tapes, and the level of quality required to achieve sufficient yield.

B68-10036
TUBE DIMPLING TOOL ASSURES ACCURATE
DIP-BRAZED JOINTS
BEUYUKIAN, C. S. HEISMAN, R. M. /N. AM.
AVIATION/ DATE- FEB. 1968
MSC-533

Portable, hand-held dimpling tool assures accurate brazed joints between tubes of different diameters. Prior to brazing, the tool performs precise dimpling and nipple forming and also provides control and accurate measuring of the height of nipples so formed.

B68-10037 SWING ARM CARRIER PROTECTS FLEXIBLE LINES DURING TEST ITEM ROTATION WARD, D. P. /N. AM. AVIATION/ DATE- FEB. 1968 MSC-11464

-7.1404 Swing arm carrier provides protection for flexible lines /fluid, electrical, RF/ connected to a test item that must be rotated through 360 degrees during test. It uses five gates riding on pivots to permit rotation of flexible lines through arcs of plus 180 degrees and minus 180 degrees.

B68-10038
CONCEPT TO STANDARDIZE SPACE VEHICLE
PIGGYBACK EXPERIMENT MODULES
CUMMINGS, A. DOWDY, W. MORITA, W. H. /N. AM.
AVIATION/ DATE- APR. 1968
M-FS-1697

Study investigates the use of spent launch vehicle stages and modules to support earth orbital operations and functions after successful completion of the primary mission. Emphasis is placed primarily on determination of those uses that afford the greatest utility with minimum possibility of degradation to the primary mission.

B68-10039 FUEL TRANSFER SYSTEM PERMITS RAPID COUPLING
WEST, A. M. /LOCKHEED MISSILES AND SPACE CO./
DATE- FEB. 1968
M-FS-91326

Docking and fuel transfer system provides an efficient method for transferring fuel from a tanker to another vehicle. With this system, no triggering operation is required prior to docking, the support system can be rigidized by simply locking the rams of shock absorbers, and no separate fuel line coupling action is required.

B68-10040
HEAT-SHRINK PLASTIC TUBING SEALS JOINTS IN GLASS TUBING
DEL DUCA, B. DOWNEY, A. DATE- FEB. 1968
LEWIS-10329

Small units of standard glass apparatus held together by short lengths of transparent heat-shrinkable polyolefin tubing. The tubing is shrunk over glass O-ring type connectors having O-rings but no lubricant.

B68-10041
IMPROVED TORCH INCREASES WELD QUALITY IN
REFRACTORY METALS
LESSMAN, G. G. SPRECACE, R. /WESTINGHOUSE ELEC.
CORP./ DATE- FEB. 1968
LEWIS-324

Specially designed torch welds refractory metals in a vacuum purged, inert gas backfilled welding chamber /weld box/ with practically zero contamination resulting from its use. Included in the torch design is a radiation shield to protect the operators hands when welding at high amperaces.

B68-10042 SUSPENDED CHAINS DAMP WIND-INDUCED OSCILLATIONS OF TALL FLEXIBLE STRUCTURES REED, W. H., III DATE- FEB. 1968 LANGLEY-10193

Hanging-chain system, which is a form of impact damper, suppresses wind-induced bending oscillations of tall cylindrical antenna masts. A cluster of chains enclosed in a neoprene shroud is suspended inside the tip of the antenna mast, forming a simple method of damping structural vibrations.

B68-10047
FAST METHOD FOR OBTAINING SCALE DIMENSIONS
ON TAPE-CONTROLLED MILLING MACHINE
THOMPSON, L. J. /N. AM. AVIATION/ DATE- MAY 1968
MSC-11609

Calculator obtains the Rail and Z Scale dimensions on the tape-controlled Sundstrand milling machine. It provides computer with depth information required to process numerical control programs which, in turn, provide the tapes for operation of N/C milling machines.

B68-10052 MULTICHANNEL WIREWAY ADAPTER BOX BLAKE, W. /N. AM. AVIATION/ DATE- MAR. 1968 MSC-90645

Adapter box provides continuous separation of different electrical leads at points where their runs must intersect. Thus, multichannel conduits of standard commercial design may be used in a manner that prevents crossing of wire leads carrying different currents where the runs intersect and change direction.

B68-10053
REMOTELY INSTALLED PIPE PLUG PROVIDES
EFFECTIVE SEAL IN HAZARDOUS ENVIRONMENT
CLIFTON, R. P. /AEROJET-GEN. CORP./ DATE- MAR.
1968
NUC-10303

Pipe plug for remote installation in an open-ended pipe used in a hazardous environment provides a gastight seal by expanding a rubber seal against the inside surface of the pipe opening, with mechanical clamps contacting the pipe flange for positive retention of the plug.

B68-10057 SYNCHRONIZED CIRCUIT IMPROVES ACCURACY OF FLUID TRANSFER MEASUREMENTS VENDL, C. J. /N. AM. AVIATION/ DATE- MAR. 1968 MSC-11167

C-11167

Shut-off valve at the destination of a transferred fluid; improves the accuracy of measurements determining the quantity of liquid transferred from a storage source to a remote location. By synchronizing this valve with the measuring device /totalizer/, the inaccuracies resulting from unfilled transfer lines can be reduced.

B68-10064
FLEXIBLE RING BAFFLES FOR DAMPING LIQUID SLOSH

BROOKS, G. W. STEPHENS, D. G. DATE- FEB. 1968 SEE ALSO NASA-TN-D-3878 LANGLEY-90194

Slosh damping, obtained through the use of small, less massive, flexible baffles, provides a relatively lightweight system for damping the motions of liquid propellants in launch vehicles, missiles, and other tankage systems.

B68-10072 CLAMP FOR DETONATING FUZE HOLDERMAN, E. J. /DOUGLAS AIRCRAFT CO./ DATE-MAR. 1968 M-FS-13399

Quick acting clamp provides physical support for a closely confined detonating fuse in an application requiring removal and replacement at frequent intervals during test. It can be designed with a base of any required strength and configuration to permit the insertion of an object.

B68-10075
MAINTAINABILITY METHODOLOGY AND
MAINTENANCE ANALYSES
BEACH, R. E. ELLIS, G. F. GRALOW, F. H.
HORSEMAN, J. J. KOZLOWSKI, F. J. /BOEING CO./
DATE- MAR. 1968
M-FS-14134 M-FS-14221

Initial approach in performing maintainability studies involves detailed description of methodology used. Maintenance analyses are formulated for system, subsystem, and component levels. These are performed to ensure that complete, integrated, logistics system support elements are identified.

B68-10078
DEVICE DAMPS FLUID PRESSURE OSCILLATIONS IN
VENT VALVE
NEIN, H. J. DATE- MAY 1968
M-FS-13290

Device, containing a tuned series arrangement of two plenum chambers and two orifices, damps high pressure fluid oscillations in a vent valve. Used in conjunction with vent valves, it relieves gas pressure that develops in liquid hydrogen and liquid oxygen tanks used on a space vehicle.

B68-10080 NUMERICAL CONTROL MACHINE DATA MANUAL MACKEY, R. T., SR. /N. AM. ROCKWELL CORP./ DATE- MAY 1968 M-FS-14342

Numerical Control Machine Data Manual provides programmers with specific information for various types and sizes of numerical control machine tools and auxiliary equipment.

B68-10082
DEPLOYABLE LATTICE COLUMN
MAUCH, H. R. /ASTRO RES. CORP./ DATE- MAY 1968
NPO-10228

Lattice column, made up of many individually collapsible sections connected in tandem, rapidly raises measuring instruments to a level appreciably above that where data is to be recorded and evaluated. The column may be collapsed by collapsing each section in sequence and is deployed by extending each section in sequence.

B68-10099
SYSTEM FOR MEASURING ROUNDNESS AND
CONCENTRICITY OF LARGE TANKS
MELTON, R. E. /SPACO/ DATE- MAY 1968

SEE ALSO B67-10214 M-FS-13362

Equipment measures the roundness and concentricity of large, massive tanks. The equipment includes a 34-foot rotary table, a variable reluctance displacement transducer, an electronics console, a digital computer, and a 5-foot plotter used for final data display.

B68-10107
ELECTROFORMED SCREENS WITH UNIFORM HOLE
SIZE
SCHAER, G. R. /BATTELLE MEM. INST./ DATE- APR.
1968
LEWIS-10117

Efficient method electroforms fine-mesh nickel screens, or plaques, with uniform hole size and accurate spacing between holes. An electroformed nickel mandrel has nonconducting silicone rubber projections that duplicate the desired hole size and shape in the finished nickel screen.

B68-10110
VISCOUS DAMPER
DEAN, W. C. /UNITED AIRCRAFT CORP./ DATE- APR.
1968
MSC-12072

Damping device exhibiting no hysteresis effect and capable of preload is used in place of a preload spring in an aneroid bellows to provide viscous damping. It operates about the action of a pressure sensing outer bellows attached to an active header above and a static header below.

B68-10111
SLEEVED DAMPER LIMITS SPRING SURGING
DEAN, W. C. /UNITED AIRCRAFT CORP./ DATE- APR.
1968
MSC-12071

Damping device limits spring surging in delicate instrumentation subjected to shock loading to tolerable limits. The device consists of a spiral formed plastic member interleaved between the spring coils in the same helix configuration.

B68-10115
METHOD FOR REINFORCING TUBING JOINTS
KINZLER, J. LEE, W. S. DATE- APR. 1968
MSC-11108

Joint repair technique uses a longitudinally split aluminum shield over the joint ferrule and immediately adjacent tubing to reseal or reinforce leaking or weak joints in small tubing. Epoxy resin coating on inside surfaces of the two shield halves provides a tightly sealed bond between shield and tubing.

B68-10117
TOGGLE OPERATED DOUBLE LATCH
BARBOUR, R. T. NECKER, D. E. /N. AM. AVIATION/
DATE- APR. 1968
MSC-11377

Double hook latch provides preloading and support capability up to 80,000 pounds and opens self-energizingly when restraint linkage is released. It incorporates a double hook latch held closed by a toggle linkage attached to a flexible cable rigged in tension.

B68-10120
PRESSURE VARIABLE ORIFICE FOR HYDRAULIC
CONTROL VALVE
AMMERMAN, R. L. /N. AM. AVIATION/ DATE- APR.
1968
MSC-11323

Hydraulic valve absorbs impact energy generated in docking or joining of two large bodies by controlling energy release to avoid jarring shock. The area of exit porting presented to the hydraulic control fluid is directly proportional to the pressure acting on the fluid.

B68-10122
MEASURING THERMAL EXPANSION OF MULTIPLE
SPECIMENS AT HIGH TEMPERATURE
GAAL, P. S. /WESTINGHOUSE ASTRONUCL. LAB./ DATEMAY 1968
NUC-10153
Furnace capable of heating 10 specimens to a

uniform temperature simultaneously, aids in the measuring of the thermal expansion of each specimen. The specimens are measured with a telescope unit consisting of two microtelescopes. Overall accuracy of the system is estimated to be plus or minus 2 percent at 2000 degrees C.

B68-10123
IMPROVED ACTIVE VIBRATION ISOLATOR
DIXON, G. V. LEATHERWOOD, J. D. STEPHENS, D. G.
DATE- APR. 1968
LANGLEY-10106

Active vibration isolator simultaneously isolates a flexible structure or payload from disturbances, attenuates the response of a flexible structure to transient disturbances, and maintains the equilibrium position of the payload within predetermined limits over a wide range of steady loads and accelerators.

B68-10125
VACUUM-JACKETED TRANSFER LINE INSTALLATION
TECHNIQUE
BOWERS, W. M. /N. AM. ROCKWELL CORP./ DATE- APR.
1968
M-FS-14496

Rolling-type spacers in the form of steel balls retained in appropriate sleeves affixed at intervals to the exterior of the transfer line facilitate the installation of a vacuum-jacketed line. They act as standoffs to position the transfer line concentrically within the vacuum jacket line.

B68-10132
IMPROVED MOLDING PROCESS ENSURES PLASTIC
PARTS OF HIGHER TENSILE STRENGTH
HEIER, W. C. DATE- APR. 1968
LANGLEY-10033

Single molding process ensures that plastic parts /of a given mechanical design/ produced from a conventional thermosetting molding compound will have a maximum tensile strength. The process can also be used for other thermosetting compounds to produce parts with improved physical properties.

B68-10134 SHALLOW GROOVES IN JOURNAL IMPROVE AIR BEARING PERFORMANCE ANDERSON, W. J. CUNNINGHAM, R. E. FLEMING, D. P. DATE- APR. 1968 LEWIS-10396

Bearing designs, which shape the surface to create artificial fluid-film wedges in the absence of any applied radial load, generate radial restoring forces to keep journals from whirling. Helical-or herringbone-grooved journals or rotors show most promise of stable operation, with no sacrifice in load capacity.

B68-10161
ROLL DIFFUSION BONDING OF TITANIUM ALLOY
PANELS
BENNETT, J. DE WITT, T. E. JONES, A. G.
KOELLER, F. MUSER, C. /N. AM. ROCKWELL CORP./
DATE- MAY 1968
M-FS-14743

Roll diffusion bonding technique is used for fabricating T-stiffened panel assemblies from titanium alloy. The single unit fabrication exhibits excellent strength characteristics under tensile and compressive loads. This program is applied to structures in which weight/strength ratio and integral construction are important considerations.

B68-10162
ASBESTOS AND INCONEL COMBINED TO FORM
HOT-GAS SEAL
WOOSTER, C. W., JR. /N. AM. AVIATION/ DATE- MAY
1968
M-FS-14004

Hot-gas seal prevents warpage tendencies in large flange joints exposed to high temperatures, such as those present in large space vehicle engine exhausts. Two Inconel wire mesh cores are held in place by an asbestos cloth cover that acts as a spacer to form the seal. B68-10165
BEARINGS USE DRY SELF-LUBRICATING CAGE
MATERIALS
ANDERSON, W. J. GLENN, D. C. SCRIBBE, H. W.
DATE- MAY 1968
LEWIS-10432

Rolling element bearings in spacecraft mechanical systems use solid lubricant composites of polytetrafluoroethylene in the bearing cage which functions as the lubricant reservoir. The cage spaces the rolling elements equally and provides the lubricant at the bearing load-carrying surface.

B68-10168
BALLAST BARGE CONCEPT FOR UNDERWATER STRUCTURES
PAYNE, V. E. DATE- JUN. 1968
KSC-10196

Ballast barge for underwater structure consists of a reinforced concrete structure partitioned into watertight compartments. The barge structure includes a 3-way venting valve, a compressed air manifold, a master valve for connecting the manifold to an air line, and an open port in each compartment for admitting and expelling sea water.

B68-10176
HIGH-TEMPERATURE BEARING-CAGE MATERIALS
ANDERSON, W. J. ZARETSKY, E. V. DATE- JUN. 1968
LEWIS-10403

Evaluation tests conducted at temperatures of 500 and 700 degrees F reveal that S-Monel and AISI M-1 steel are suitable as high temperature cage materials for precision bearings. The area of the wear scar in the cage pocket that developed during the test was used as the measure of wear.

B68-10180
SQUEEZE-FILM GAS BEARING TECHNOLOGY
PAN, C. H. T. /MECH. TECHNOL./ DATE- JUN. 1968
SEE ALSO B66-10226
M-FS-14821

Squeeze-film bearing is studied to develop a low-friction suspension for the output-axis gimbal of a single-degree-of-freedom gyroscope. Included are a review of pertinent literature, the theory of squeeze-film lubrication, and design elements.

B68-10209
MAGNETICALLY CONTROLLED TORQUE WRENCH
PREVENTS OVERTORQUING
ROHRER, J. A. DATE- JUN. 1968
SAN-10002

Magnetically controlled torque wrench produces the required torque values accurately, and prevents overtorquing. The force between a magnet and a soft iron bar on the arms of the wrench constitutes a predetermined maximum torque that cannot be exceeded. So long as the magnetic flux remain constant, the torque remains the same.

B68-10211
PROPOSED GAS GENERATION ASSEMBLY WOULD RECOVER DEEPLY SUBMERGED OBJECTS SPRAGUE, C. W. DATE- JUN. 1968
SAN-10007

-10007
Gas generation system, used for recovery of submerged objects, generates hydrogen gas by the reaction of sodium with sea water. The assembly consists of flooded flotation tanks cabled together, equipped with relief valves to equalize pressure as the array ascends and hydrostatic pressure diminishes, and carrying remotely activated welding units.

B68-10219
PACKAGING CRITERIA FOR TRANSPORTATION AND HANDLING SHOCK AND VIBRATION DATE-JUN. 1968
M-FS-13007

Information compiled on the shock and vibration environment encountered by items and equipment during shipment shows the distribution of drop heights for particular packages, distribution systems, and handling operations. Applications of the data to typical package design problems are discussed.

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B68-10222
ASSEMBLY, CHECKOUT, AND OPERATION
OPTIMIZATION ANALYSIS TECHNIQUE FOR
COMPLEX SYSTEMS
/INNOVATOR NOT GIVEN/ DATE- JUN. 1968
M-FS-14105 M-FS-14132 M-FS-14137
Computerized simulation model of a launch
vehicle/ground support equipment system optimizes
assembly, checkout, and operation of the system.
The model is used to determine performance
parameters in three phases or modes - /1/ systems
optimization techniques, /2/ operation analysis
methodology, and /3/ systems effectiveness
analysis technique.
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B68-10225
LASER SYSTEM USED FOR DYNAMIC BALANCING OF GYROS
POPICK, H. ROBERTS, D. L. /KORAD CORP./ DATE-JUN. 1968
M-FS-12218

System using a pulsed ruby laser balances or trims gyro rotors spinning at speeds of up to 24,000 rpm. It is designed to detect high spots on the spinning rotor and to focus a precisely timed laser beam on these detected spots.

B68-10229
EFFECT OF SURFACE IRREGULARITIES ON BELLOWS
FATIGUE LIFE
SCHMIDT, E. H. SHEAFFER, E. F. TURNER, J. D.
ZEIMER, R. L. /N. AM. ROCKWELL CORP./ DATE- JUL.
1968
M-FS-14480

ro-14400
Report presents test data on the bending fatigue life of notched sheet specimens. The influence of a surface irregularity on the fatigue life of a metal bellows is evaluated, with emphasis on accidental defects in ducting bellows which are impossible to avoid short of completely eliminating human contact.

B68-10235
TUBE SWAGING DEVICE USES EXPLOSIVE FORCE
MC SMITH, D. G. DATE- JUL. 1968
LANGLEY-10092

Tool joins a sleeve to a tube by explosive swaging, thus providing a leakproof, lightweight, and strong assembly. No new or different material is used in this method and therefore the thermal and galvanic properties are maintained.

B68-10237
DUAL RATE PRESSURE RELIEF VALVE
STEENEKEN, J. /GARRETT CORP./ DATE- JUL. 1968
MSC-11606

3-11606 Pressure relief valve vents at a slow bleed rate at one pressure level and at a higher bleed rate at a higher pressure level. The value housing contains a sleeve, inlet port, outlet port, an orifice, a ball and seat arrangement, and a belleville spring diaphragm.

B68-10239
MANUAL OF INDUSTRIAL DIAMONDS PLUS DRESSING
AND GRINDING CRITERIA FOR MACHINING
SUPERALLOYS
CARR, W. L. /N. AM. ROCKWELL CORP./ DATE- JUL.
1968

M-FS-14582

Manual combines the important and controlling factors for the proper selection and use of diamond stones for cutting and dressing grinding wheels. This manual is a compilation of empirical data and incorporates an original companion treatise on the physical descriptions of the diamond stones, their grading, and their applications.

B68-10247
DYNAMICALLY STABLE CHECK VALVE CONCEPT FOR WIDE FLOW RANGE
ABSALON, J. G. /N. AM. ROCKWELL CORP./ DATE-JUL. 1968
M-FS-14579

Poppet-type check valve design accommodates a wide flow range without the usual chatter problem at low flow conditions. This pressure isolation check valve is proposed for the J-2 rocket

pneumatic package.

B68-10248
TENSILE TESTING GRIPS ENSURE UNIFORM LOADING
OF BIMETAL TUBING SPECIMENS
DRISCOL, S. D. HUNT, V. /AEROJET-GEN. CORP./
DATE- SEP. 1968
LEWIS-10267
Tensile testing grip uniformly distributes

rensile testing grip uniformly distributes stresses to the internal and external tube of bimetal tubing specimens. The grip is comprised of a slotted external tube grip, a slotted internal tube grip, a machine bolt and nut, an internal grip expansion cone, and an external grip compression nut.

B68-10249
HIGH-TEMPERATURE BEARING LUBRICANTS
ANDERSON, W. J. PARKER, R. J. ZARETSKY, E. V.
DATE- SEP. 1968
LEWIS-10408

Synthetic paraffinic oil lubricates ball bearings at temperatures in the 600 degrees F range. The lubricant contains antiwear and antifoam additives, is thermally stable in the high temperature range, but requires protection from oxygen.

B68-10250 QUICK-ATTACH CLAMP VANO, A. E. DATE- JUL. 1968 XFR-05421

Clamp of the slideable jaw type can be applied to moving lines such as cables or ropes. The clamp has a trigger—operated jaw that can be attached to a redrop parachute on a moving tow cable. The trigger mechanism maintains the jaws retracted in the housing until they are released for clamping.

B68-10257
INSPECTION CRITERIA ENSURE QUALITY CONTROL
OF PARALLEL GAP SOLDERING
BURKA, J. A. /SPACO, INC./ DATE- JUL. 1968
M-FS-14530

Investigation of parallel gap soldering of electrical leads resulted in recommendation on material preparation, equipment, process control, and visual inspection criteria to ensure reliable solder joints. The recommendations will minimize problems in heat-dwell time, amount of solder, bridging conductors, and damage of circuitry.

B68-10261
DYNAMIC-RESERVOIR LUBRICATING DEVICE
FICKEN, W. H. SCHULIEN, H. E. /BENDIX CORP./
DATE- JUL. 1968
M-FS-14652

Dynamic-reservoir lubricating device supplies controlled amounts of lubricating oil to ball bearings during operation of the bearings. The dynamic reservoir lubricating device includes a rotating reservoir nut, a hollow cylinder filled with lubricating oil, flow restrictors and a ball bearing retainer.

B68-10266
SHOCK-ABSORBING CASTER WHEEL IS SIMPLE AND
COMPACT
KINDLEY, R. J. DATE- JUL. 1968
SAN-10019

Compact shock-absorbing caster wheel mitigates or absorbs shock by a compressible tire which deforms into a cavity between its inner edge and the wheel hub. A tee-shaped annular ring embedded in the tire distributes loads more uniformly throughout both wheel and tire.

B68-10270
SPIRAL-GROUVED SHAFT SEALS SUBSTANTIALLY
REDUCE LEAKAGE AND WEAR
ALLEN, G. P. JOHNSON, R. L. LUDWIG, L. P.
STROM, T. N. DATE- JUL. 1968
LEWIS-10397

Rotating shaft seals used in space power systems have spiral grooves in one or both of the opposing seal faces. These grooves induce a pumping action which displaces the intervening fluid radially inward toward the shaft and counters the centrifugal forces which tend to displace the

fluid outward.

B68-10277
THERMAL PROTECTIVE VISOR FOR ENTERING HIGH TEMPERATURE AREAS
BURGETT, F. A. DATE- AUG. 1968
MSC-10285

Chamber observer suit visor protects the eyes and ears of the wearer while he is performing rescue operations during a fire. The visor is a simple curved sandwich of selected glass plates, gold coated polyester plastic film, and a dead air space, all mounted in an aluminum frame.

B68-10284
FABRICATION TECHNIQUES DEVELOPED FOR SMALLDIAMETER, THIN-WALL TUNGSTEN AND TUNGSTEN
ALLOY TUBING
BRILLHART, D. C. BURT, W. R. KARASEK, F. J.
MAYFIELD, R. M. DATE- AUG. 1968 SEE ALSO
ANL-7151
ARG-10100

Report describes methods for the fabrication of tungsten and tungsten alloys into small-diameter, thin-wall tubing of nuclear quality. The tungsten, or tungsten alloy tube-blanks are produced by double extrusion. Plug-drawing has emerged as an excellent secondary fabrication technique for the reduction of the overall tube dimensions.

B68-10286
BETWEEN-BEARING SHAFT SEAL, A CONCEPT
FURST, R. B. /N. AM. ROCKWELL CORP./ DATE- AUG.
1968
M-FS-18179

Placing the shaft seals, in an oxidizer pump, between the pump bearings, reduces the shaft overhang length and overall turbopump length. This arrangement of the components in the pump removes the seals from the hot turbine region.

B68-10288
ADVANCES IN LIGHT-GAS GUN TECHNOLOGY
COWAN, P. L. MURPHY, J. R. /COMPUTING DEVICES OF
CANADA/ DATE- AUG. 1968
M-FS-14270

Constant-area accelerator used with light-gas guns increases the velocity of accelerating projectiles. A disposable accelerator on the muzzle of the gun uses the energy and momentum of a primary projectile, launched by the gun, to achieve high velocities of a light secondary projectile accelerated from rest in the accelerator.

B68-10295
VENTURI METER WITH SEPARABLE DIFFUSER
DUDZINSKI, T. J. JOHNSON, R. C. KRAUSE, L. N.
DATE- AUG. 1968
LEWIS-10483

The diffuser and nozzle of venturi meters are made as separate pieces for easier fabrication. Venturi meter efficiency is affected by the diffuser inlet diameter being greater than two percent larger than the throat diameter, by Reynolds number and by mach number.

PREPARING ROCK POWDER SPECIMENS OF CONTROLLED SIZE DISTRIBUTION BLUM, P. VORTON RES. CORP./ DATE- AUG. 1968 NPO-10007

B68-10297

Apparatus produces rock powder specimens of the size distribution needed in geological sampling. By cutting grooves in the surface of the rock sample and then by milling these shallow, parallel ridges, the powder specimen is produced. Particle size distribution is controlled by changing the height and width of ridges.

B68-10299
HIGH-TORQUE POWER WRENCH, A CONCEPT
COX, E. F. /N. AM. ROCKWELL CORP./ DATE- AUG.
1968
M-FS-18194

High-torque power wrench is small enough to be handled by one or two men yet has sufficient torque to remove 1-1/2- to 4-inch nuts from high-pressure tanks and valves. The action can be made automatic by use of solenoid-operated valves and suitable switches.

B68-10300 CONCEPTUAL HERMETICALLY SEALED ELBOW ACTUATOR WUENSCHER, H. F. DATE- AUG. 1968 M-FS-14710

Electrically or hydraulically powered, hermetically sealed angular or rotary actuator deflects mechanical members over a range of plus or minus 180 degrees. The actuator design provides incremental flexures which keep the local deflection rate within elastic limits.

B68-10318
COMPRESSIBLE SLEEVE PROVIDES AUTOMATIC
CENTERING FOR GRINDING OR TURNING OF
CYLINDERS
ROHRER, J. A. DATE- AUG. 1968
SAN-10021

Elastomeric sleeve supported on a threaded mandrel automatically centers cylindrical castings for grinding or turnings. By expanding the diameter of the sleeve with pressure against the ends, the casting becomes rigidly supported and the surfacing operation can be completed.

B68-10331
ELECTRON BEAM SELECTIVELY SEALS POROUS METAL FILTERS
SNYDER, J. A. /HUGHES AIRCRAFT CO./ TULISIAK, G. DATE- SEP. 1968
LEWIS-10162
Electron beam welding selectively seals the outer

Electron beam welding selectively seals the outer surfaces of porous metal filters and impedances used in fluid flow systems. The outer surface can be sealed by melting a thin outer layer of the porous material with an electron beam so that the melted material fills all surface pores.

B68-10332
DUAL WIRE WELD FEED PROPORTIONER
NUGENT, R. E. /N. AM. ROCKWELL CORP./ DATE- SEP.
1968
M-FS-18037

Dual feed mechanism enables proportioning of two different weld feed wires during automated TIG welding to produce a weld alloy deposit of the desired composition. The wires are fed into the weld simultaneously. The relative feed rates of the wires and the wire diameters determine the weld deposit composition.

B68-10338 TWO-FLUID, IMPINGING-SHEET INJECTOR RIEBLING, R. W. DATE- SEP. 1968 NPO-10547

Two-fluid, impinging-sheet propellant injector reduces the severe erosion found to occur when ejector elements are directly exposed during throttling without the benefits of a cooling flow of the propellant liquids. It greatly improves combustion efficiency by venting the secondary stream of combustion gases generated by backspray reaction.

B68-10343 X-RAY FILM HOLDER PERMITS SINGLE CONTINUOUS PICTURE OF TUBING JOINT DIAMOND, J. W. HUNT, V. MIKESELL, C. /AEROJET-EGEN. CORP./ DATE- SEP. 1968 LEWIS-10382

X ray technique produces a clear continuous picture of a welded brazed tubing joint on a single film with one exposure. A stationary X ray source located in the plane of the joint to be inspected, a means of rotating the tube, and a unique internal film holder and positioning fixture are used.

B68-10352
MACHINING TECHNIQUE PREVENTS UNDERCUTTING
IN TENSILE SPECIMENS
MOSCATER, R. E. ROYSTER, D. M. DATE- SEP. 1968
LANGLEY-10281

Machining technique prevents undercutting at the test section in tensile specimens when machining

the four corners of the reduced section. Made with a gradual taper in the test section, the width of the center of the tensile specimen is less than the width at the four corners of the reduced section.

B68-10353
SHOCK AND VIBRATION RESPONSE OF MULTISTAGE
STRUCTURE
LEE, S. Y. LIYEOS, J. G. TANG, S. S. /N. AM.
ROCKWELL CORP./ DATE- SEP. 1968

M-FS-14972
Study of the shock and vibration response of a multistage structure employed analytically, lumped-mass, continuous-beam, multimode, and matrix-iteration methods. The study was made on the load paths, transmissibility, and attenuation properties along a longitudinal axis of a long, slender structure with increasing degree of complexity.

B68-10359
REMOTELY OPERATED GRIPPER PROVIDES VERTICAL
CONTROL ROD MOVEMENT
HUTTER, E. KOCH, L. J. DATE- SEP. 1968
ARG-10160

Remote actuation of a gripper shaft affects vertical engagement between a drive shaft and control rod. A secondary function of the gripper is to provide remote indication of positive completion of the gripping or ungripping operation.

WERSATILE IMPACT HAND TOOL
HODIL, E. R. /OLIN WINCHESTER/ DATE- OCT. 1968
M-FS-20140

Improved cartridge-actuated impact hand tool includes a common power head and four attachments to punch holes, drive forced entry fasteners, hammer, and shear. The attachments are self-contained and easily fitted to the power head assembly.

B68-10372 IMPROVED ELECTROMECHANICAL MASTER--SLAVE MANIPULATOR

FORSTER, G. GOERTZ, R. GRIMSDN, J. MINGESZ, D. POTTS, C. DATE- OCT. 1968 ARG-10027

Electric master-slave manipulator uses force multiplication and allows the operator to remotely control the slave arm. Both the master and slave arms execute seven distinct motions by a specially designed force-reflecting servo having a one to one correspondence between the motion at the master and slave.

B68-10383 EFFECTS OF HIGH FREQUENCY CURRENT IN WELDING ALUMINUM ALLOY 6061 FISH, R. E. /N. AM. ROCKWELL CORP./ DATE- OCT. 1968 M-FS-18337

Uncontrolled high frequency current causes cracking in the heat-affected zone of aluminum alloy 6061 weldments during tungsten inert gas ac welding. Cracking developed when an improperly adjusted superimposed high frequency current was agitating the semimolten metal in the areas of grain boundary.

B68-10387
MINIATURE PAINT-SPRAY GUN FOR RECESSED
AREAS
VANASSE, M. A. /N. AM. ROCKWELL CORP./ DATEDCT. 1968
MSC-13060

Miniature spray gun regulates paints and other liquids to spray at close range, facilitating spraying of remote or recessed areas. Individual valves for regulating air pressure and paint maximizes atomization for low pressure spraying.

B68-10393
DETERMINING GAS LEAKAGE FROM BUBBLE FORMATIONS
DECASTRA, J. E. WELLS, F. E. DATE- OCT. 1968
M-FS-14841

Gas leakage rates are quantitatively estimated using threaded and flanged fittings by standardizing bubble appearance. Three classes of bubble formations have been proposed.

B68-10395
DESIGN OF FLUID-DUCT BENDS WITH LOW
PRESSURE LOSS
GERLACH, R. /SOUTHWEST RES. INST./ DATE- DCT.
1968
M-FS-20176

Duct bends are designed in which pressure losses and velocity profile distortions due to centrifugal force gradients are significantly reduced. The correction is achieved by properly changing the cross sectional area through the bend without affecting the shape of the duct at the upstream and downstream sides.

B68-10398
BATTERY-PACKAGE DESIGN PROVIDES FOR CELL
COOLING AND CONSTRAINT
GROSS, S. /BDEING CO./ DATE- OCT. 1968
MSC-11839

Lightweight battery-package provides for even cooling of individual alkaline cells, constraint against cell expansion, and convenient placement of cells. The battery package also provides for venting of the cells and includes instrumentation to measure cell temperature, pressure, and voltage.

B68-10401
COMPACT MONITORING AND CONTROL CONSOLE FOR PRESSURIZED GAS BOTTLES
FREEMAN, B. PILICHI, C. A. /N. AM. ROCKWELL CORP./ DATE- NOV. 1968
M-FS-14874

Compact monitoring and control console dispenses gas over a range of pressures from conventional compressed—gas cylinders. It incorporates in a single assembly the necessary equipment for a portable pressurization system that can be used in welding and other operations requiring a controlled gas supply.

B68-10407
AN INVESTIGATION OF PARTICLE MIXING IN A
GAS-FLUIDIZED BED
CARLSON, R. E. GABOR, J. D. DATE- DEC. 1968
ARG-10182

Mechanism for particle movement in gas-fluidized beds was studied both from the theoretical and experimental points of view. In a \*\*two-dimensional\*\* fluidized bed particle trajectories were photographed when a bubble passed through.

B68-10417
HAND-TIGHTENED, HIGH-PRESSURE SEAL
MEYER, W. A. /N. AM. ROCKWELL CORP./ DATE- DEC.
1968
M-FS-18416

To provide flared tubing and hose connections for high-pressure hand tightened cryogenic service, a 1/4-inch male AN seal was modified by machining to receive a special, double-truncated-cone-shaped Kel-F washer between it and the flared flex hose connector.

B68-10439
HYDROSTATIC TESTING OF POROUS ASSEMBLIES
BIGELOW, W. L. /N. AM. ROCKWELL CORP./ DATEDEC. 1968
M-FS-18298

Pores of the material were plugged with dust particles suspended in water. The plugging material used was a standard test dust prepared as a slurry in distilled water. This technique provides a permanent high-integrity seal for porous material without affecting its physical properties, yet permitting pressure testing to verify structural adequacy.

B68-10440 LOW FRICTION SERVO VALVE DUSTIN, M. O. DATE- NOV. 1968 LEWIS-10574

Valve was developed using air bearings which

provide frictionless operation. The servo valve is of the flat plate type with rectangular meter openings. Fluid bearings support the metering plate. The overlap is adjustable by means of a variable hinge block support.

B68-10441
LOW COST TECHNIQUES FOR FABRICATING LOBED
BEARINGS
SCHULLER, F. T. DATE- NOV. 1968
LEWIS-10296

New low cost technique utilizes shims to create the lobes in bearing. Conventional methods of manufacture require accurate off-center grinding of the inside diameter of a bearing in a housing at various arc lengths depending on the number of lobes required.

B68-10442 AIR BEARING LIFT PAD /ABLP/ BLAISE, H. T. DANE, D. H. DATE- DEC. 1968 M-FS-14685

ABLP is a hybrid between the precision air bearings and hover craft vehicles. The ABLP floats above the surface to clear cracks, roughness, and unevenness with the almost nonexistent friction of precision air pads.

B68-10444
COAXIAL CABLE STRIPPER FOR CONFINED AREAS
BROWN, J. D. LIPSCOMB, W. G. /BOEING CO./ DATENOV. 1968
KSC-10167

Manual coaxial cable stripper quickly and accurately prepares a coaxial cable in a confined area. With this tool, preparation time is greatly reduced, and a completely inexperienced technician can perform the operation.

B68-10503
FLUID POWER-TRANSMITTING GAS BEARING
COLLINS, D. DE FURIA, R. EZEKIEL, F. YANG, P.
DATE- NOV. 1968
ERC-10097

Fluid power-transmitting gas bearing was designed that is essentially frictionless, stable, and highly efficient. The two basic components of this design are the base assembly and the upper plate. System could be a fluidic control system, a momentum exchange or reaction jet device.

B68-10507
ELECTRONIC COMPONENT RELIABILITY ANALYSIS
BY DATA REDUCTION SYSTEM
DIMM, R. M. HUNT, D. G. /BOEING CO./ DATE- NOV.
1968
NPO-10243

Mechanized data reduction system has been designed to take advantage of the data handling capacity of computers and to reduce voluminous and unrelated test and performance data to a format useful for the rapid analysis of electronic component reliability.

B68-10509
ROTARY-KNIFE STRIPPER FACILITATES REMOVAL
OF X-RAY FILM FROM PACK
MITCHELL, D. K. /BOEING CO./ DATE- NOV. 1968
M-FS-14837

Rotary-knife stripper facilitates removal of X-ray film from the daylight pack paper sleeve. The new stripper is rectangular, approximately 4 inches wide, 5 inches high, and 7 inches long.

B68-10512 BOYDBOLT, A POSITIVE-LATCH, SIMPLE-RELEASE FASTENER BRUEGER, J. FENSKE, T. HAMILL, W. KATZ, M. /BENDIX CORP./ DATE- NOV. 1968 MSC-13061

Fastener /Boydbolt/ has recently been designed to furnish positive lock and release characteristics that positively prevent accidental adverse functions of lock or release.

B68-10515
FATIGUE OF REINFORCED CONCRETE BEAMS UNDER
DYNAMIC LOADING
CHAN, G. C. /WYLIE LABS./ DATE- NOV. 1968

M-FS-14980

Study, consisting of a literature survey and experiments, determined the strength properties of reinforced concrete beams subjected to vibrational stresses.

B68-10530
VERTICAL BORING MILL CAPACITY IS INCREASED
YOUNG, R. J. /N. AM. ROCKWELL CORP./ DATE- NOV.
1968
M-FS-16196

Commercially available vertical boring mill with a nominal capacity to 27 feet in diameter of workpiece has been modified in-shop to handle work up to 36 feet in diameter. Capacity was increased by adding extension saddles to the mill support columns on each side.

B68-10531
DESIGN ELIMINATES RADIAL THERMAL EXPANSION
IN TURBINE STATOR COMPONENTS
ANDERSON, M. J. DIETRICH, J. A. /N. AM. ROCKWELL
CORP./ DATE- NOV. 1968
M-FS-18146

Stress levels created in turbine stator components because of differential thermal expansion was eliminated by incorporation of a semifloating design, in which the stator vanes are retained by the outer ring assembly and radially piloted in the inner ring.

B68-10534
IMPROVED THERMAL TREATMENT OF ALUMINUM
ALLOY 7075
COCKS, F. H. /TYCO LABS./ DATE- DEC. 1968
M-FS-20083

Newly developed tempering treatment considerably increases the corrosion resistance of 7075-T6 alloy and concomitantly preserves its yield strength. The results of tests on samples of the alloy subjected to the above treatments show that when the overaging period is 12 hours /at 325 degrees F/, the alloy exhibits a yield strength of 73,000 psi.

B68-10535 PYROTECHNIC-ACTUATED CABLE RELEASE HANSON, R. W. DATE- DEC. 1968 XNP-10849

Remote, unattended means has been designed and reduced to practice that retains and then releases an attached load by means of a restrained cable. The cable is released by an electrical impulse on signal.

B68-10537
FLUIDIC TRANSDUCER GIVES PRESSURE OUTPUT AS FUNCTION OF TEMPERATURE WALL, D. B. /MARTIN CO./ DATE- DEC. 1968
SEE ALSO B68-10538
ERC-10093

Fluidic transducer gives a pressure output signal that is a direct function of the differential temperature sensed by the device. The transducer is arranged as a bridge.

FLUIDIC ANALOG AMPLIFIER
MC KENZIE, C. P. /MARTIN CO./ DATE- DEC. 1968
SEE ALSO B68-10537
ERC-10102

Five-stage, high-gain, push-pull fluidic amplifier provides increased range and improved linearity. The fluidic amplifier was designed to operate in conjunction with a fluidic transducer.

B68-10540
TUBE JOINT LEAK REPAIR COUPLING
FERGUSON, W. B. /N. AM. ROCKWELL CORP./ DATEDEC. 1968
MSC-15022

Tube joint leak repair coupling consists of 2 split seals, 1 male split nut, 1 female split nut, and two aligning pins. Each split nut consists of 2 half-shell sections which, when engaged, are held together by a dovetail joint and an aligning pin.

B68-10549 HIGH-TORQUE PRECISION STEPPING DRIVE KASPARECK, W. E. DATE- NOV. 1968 M-FS-14772

Stepping drive has been designed for precise incremental angular positioning of scale models of spacecraft about a horizontal axis in order to accurately measure antenna receiving and transmitting characteristics. Positioning is insured by spring-loaded, self-locking plungers.

B68-10550
CONTACT-SPRING FORMING MACHINE FOR FLAT
CONDUCTOR CABLE RECEPTACLES
ANGELE, W. MARTINECK, H. G. DATE- DEC. 1968
SEE ALSO NASA-SP-5043
M-FS-20126

Machine tool produces beryllium-copper contact springs for FCC /flat conductor cable/ feed-through receptacles. The springs are heat-treated and plated to impart the required electrical contact properties.

B68-10551
WELD PREPARATION TOOL FOR PIPES AND TUBING WALLACE, E. D. DATE- DEC. 1968
KSC-09955

Improved scarfing tool consists of a mount-table, roller-guided assembly. It converts a conventional routing machine for relatively precise field preparation of pipes for welding.

B68-10567
RADIAL INFLOW TURBINE DESIGN CHARTS
ROHLIK, H. E. DATE- DEC. 1968
LEWIS-10720

Design charts were prepared for the selection of turbine geometry corresponding to maximum turbine efficiency. Optimum values can be determined as functions of specific speed.

B68-10573
FIXTURE FACILITATES SOLDERING OPERATIONS
WHITE, C. M. /CHRYSLER CORP./ DATE- DEC. 1968
M-FS-14456

Soldering fixture, designed for printed circuit cards, is a basic bench-mounted, self-contained integral unit combining all soldering needs into a compact, readily available work station. All tools, materials, and accessories are available to provide an ideal station to perform critical soldering.

B68-10575
HOISTING FRAME FACILITATES HANDLING OF LARGE
OBJECTS
COLPEAN, K. V. HOLCOMB, D. F. /N. AM. ROCKWELL
CORP./ DATE- DEC. 1968
M-FS-16166

Hoisting frame can be used with a standard 5-ton forklift to handle the large spreader bars, or other bulky pieces of equipment, much faster and more efficiently than with a boom or gantry crane. In addition forklifts of this type are more readily available.

## **06** COMPUTER PROGRAMS

B66-10005 MOP /MATRIX OPERATION PROGRAMS SYSTEM/ MULLER, P. M. DATE- JAN. 1968 NPO-10429

D-10429
MOP /Matrix Operation Programs/ system
Consists of a set of FORTRAN 4 subroutines which
are related through a small common allocation.
The system accomplishes all matrix algebra
operations plus related input-output and
housekeeping details.

B68-10006
COMPUTER PROGRAM PERFORMS FREQUENCY
ANALYSIS OF NONUNIFORM TURBINE DISK
SUBJECTED TO TEMPERATURE GRADIENTS
SOO, P. P. /AEROJET-GEN. CORP./ DATE- JAN. 1968
NUC-10301
Computer program determines the natural

frequencies of a turbine disk of variable thickness subjected to uniform rotation and radial temperature gradients by using \*\*Rayleigh-Ritz\*s\*\* procedure. The program involves the potential and kinetic energy expressions for a circular flat plate of variable thickness.

B68-10009
COMPUTER PROGRAM CALCULATES AND PLOTS
SURFACE AREA AND PORE SIZE DISTRIBUTION DATA
HALPERT, G. DATE- MAY 1968
GSFC-10362

Computer program calculates surface area and pore size distribution of powders, metals, ceramics, and catalysts, and prints and plots the desired data directly. Surface area calculations are based on the gas adsorption technique of Brunauer, Emmett, and Teller, and pore size distribution calculations are based on the gas adsorption technique of Pierce.

B68-10025
COMPUTER PROGRAM FOR CALCULATION OF IDEAL
GAS THERMODYNAMIC DATA
GORDON, S. MC BRIDE, B. J. DATE- MAY 1968
SEE ALSO NASA-TN-D-4097 AND NASA-TN-D-1454
LEWIS-10254

Computer program calculates ideal gas thermodynamic properties for any species for which molecular constant data is available. Partial functions and derivatives from formulas based on statistical mechanics are provided by the program which is written in FORTRAN 4 and MAP.

B68-10033 COMPUTER PROGRAM FOR INTERPLANETARY CONIC PATCHING DAVIS, D. A. GUSSOW, D. G. /BOEING CO./ DATE-FEB. 1968 M-FS-14296

Computer program enables study of one-way transfers, single and double planet flybys, single and double planet stopovers, or mixed flyby and stopover trajectories. In each operation it first computes the helicocentric conic which connects the centers of the launch and target planets and requires a given trip time.

B68-10044
GENERAL COMPUTER PROGRAM FOR CALCULATION
OF RADIATION FROM INHOMOGENEOUS, NONISOBARIC,
NONISOTHERMAL ROCKET EXHAUST PLUME
DASH, M. J. HUFFAKER, R. M. DATE- FEB. 1968
M-FS-14314

Computer program evaluates radiation from an axisymmetric gas body with water vapor, carbon dioxide, carbon monoxide, and solid carbon particles as radiating constituents, and hydrogen as a nonradiating constituent. The program provides a convenient method of evaluating a great many problems of radiation from rocket exhaust plumes.

B68-10045 CONCEPT FOR SIMPLIFIED SERIAL DIGITAL DECODER GREEN, R. R. DATE- FEB. 1968 NPO-10150

Modular decoder, which lends itself best to special purpose digital equipment using sequential access memories, decodes the first order Reed-Muller codes. It functions as a maximum-likelihood exhaustive-search decoder and is a modular implementation to accommodate codes of any length.

B68-10050 SITE SURVEY FOR OPTIMUM LOCATION OF OPTICAL COMMUNICATION EXPERIMENTAL FACILITY INNOVATOR NOT GIVEN /SYLVANIA ELECTRON. SYSTEMS-EAST/ DATE- MAR. 1968 M-FS-13155

Site survey was made to determine the optimum location for an Optical Communication Experimental Facility /OCEF/ and to recommend several sites, graded according to preference. A site was desired which could perform two-way laser communication with a spacecraft and laser tracking

with a minimum of interruption by weather effects.

R68-10055 THREAD CUTTING WITH 3-AXIS N/C MILLING MACHINE

SALLEY, G. C. WOOD, C. H., JR. DATE- MAR. 1968 LANGLEY-10017

TAPDIE, a generalized macro written for the APT numerical control system, cuts threads in stock too big for conventional machines or for which conventional methods are unsuitable. TAPDIE computes the machine tool path necessary and the information is passed on to a post-processor which produces a control tape.

B68-10096 COMPUTER PROGRAM PERFORMS STIFFNESS MATRIX STRUCTURAL ANALYSIS

BAMFORD, R. BATCHELDER, R. SCHMELE, L. WADA, B. K. DATE- APR. 1968
NPO-10502

Computer program generates the stiffness matrix for a particular type of structure from geometrical data, and performs static and normal mode analyses. It requires the structure to beomodeled as a stable framework of uniform, weightless members, and joints at which loads are applied and weights are lumped.

COMPUTER PROGRAM CALCULATES VELOCITIES AND STREAMLINES IN TURBOMACHINES KATSANIS, T. DATE- MAY 1968 LEWIS-10252

Computer program calculates the velocity distribution and streamlines over widely separated blades of turbomachines. It gives the solutions of a two dimensional, subsonic, compressible nonviscous flow problem for a rotating or stationary circular cascade of blades on a blade-to-blade surface of revolution.

B68-10127 AUTOMATIC PLANNING CONCEPT - AN ANALYSIS OF OPTIMUM SCHEDULING REBELEIN, P. R. TRUENBELS, P. /HONEYWELL, INC./ DATE- APR. 1968 M-FS-14198

Study considers resource costs, mission constraints, and experiment results as linear functions, insofar as possible, in an effort to develop optimum scheduling by the use of linear programming. It involves a mathematical approach in which a number of constraints are considered

B68-10137 COMPUTER PROGRAM CONDUCTS FACILITIES UTILIZATION AND OCCUPANCY SURVEY
MINER, R. R. SPRAGUE, H. R. ZIMMERMAN, J. S.
DATE- APR. 1968 SEE ALSO B67-10476 NPO-10438

Computer program identifies the uses of all facilities and provides information on the net area in each room as well as the number and classification of people occupying them. The system also provides a means to indicate unsatisfactory work areas and may be able to be updated each month.

COMPUTER PROGRAM AIDS DUAL REFLECTOR ANTENNA SYSTEM DESIGN
FIRNETT, P. GERRITSEN, R. JARVIE, P.
/INFORMATICS, INC./ LUDWIG, A. DATE- APR. 1968 NPO-10501

Computer program aids in the design of maximum efficiency dual reflector antenna systems. designs a shaped Cassegrainian antenna which has nearly 100 percent efficiency, and accepts input parameters specifying an existing conventional antenna and produces as output the modifications necessary to conform to a shaped design.

COMPUTER PROGRAMS FOR THERMODYNAMIC AND TRANSPORT PROPERTIES OF HYDROGEN
HALL, W. J. MC CARTY, R. D. RODER, H. M. /NATL.
BUR. OF STD./ DATE- MAY 1968 NUC-10537

Computer program subroutines provide the Jumputer program suproutines provide the thermodynamic and transport properties of hydrogen in tabular form. The programs provide 18 combinations of input and output variables. This program is written in FORTRAN 4 for use on the IBM 7044 or CDC 3600 computers.

COMPUTER PROGRAM DETERMINES EXACT TWO-SIDED TOLERANCE LIMITS FOR NORMAL DISTRIBUTIONS CORP./ DATE- MAY 1968
M-FS-18045

Computer program determines by numerical integration the exact statistical two-sided tolerance limits, when the proportion between the limits is at least a specified number. The program is limited to situations in which the underlying probability distribution for the population sampled is the normal distribution with unknown mean and variance.

COMPUTER PROGRAM DETERMINES VIBRATION IN THREE-DIMENSIONAL SPACE OF HYDRAULIC LINES EXCITED BY FORCED DISPLACEMENTS /N. AM. AVIATION/ DATE- MAY 1968 DODGE, W. G. M-FS-12226

Computer program determines the forced vibration in three dimensional space of a multiple degree of freedom beam type structural system. Provision is made for the longitudinal axis of the analytical model to change orientation at any point along its length. This program is used by industries in which structural design dynamic analyses are performed.

DIGITAL FILTER SYNTHESIS COMPUTER PROGRAM MOYER, R. A. MUNOZ, R. M. DATE- MAY 1968 ARC-10130

Digital filter synthesis computer program expresses any continuous function of a complex variable in approximate form as a computational algorithm or difference equation. Once the difference equation has been developed, digital filtering can be performed by the program on any input data list.

B68-10187 ELAS - A GENERAL PURPOSE COMPUTER PROGRAM FOR THE EQUILIBRIUM PROBLEMS OF LINEAR STRUCTURES AKYUZ, F. A. UTKU, S. DATE- JUN. 1968 NPO-10598

Digital computer program ELAS handles the equilibrium problems of linear structures of one, two, or three dimensional continuum. ELAS generates the governing equations for the unknown deflections of the mesh points that define the stationary point of the total potential energy function associated with the given loading and unknown deflections.

DIGITAL FILTER SUPPRESSES EFFECTS OF NONSTATISTICAL NOISE BURSTS ON MULTICHANNEL SCALER DIGITAL AVERAGING SYSTEMS
GOODMAN, L. S. SALTER, F. D. DATE- JUN. 1968 ARG-90143

Digital filter suppresses the effects of nonstatistical noise bursts on data averaged over multichannel scaler. Interposed between the sampled channels and the digital averaging system, it uses binary logic circuitry to compare the number of counts per channel with the average number of counts per channel.

B68-10208 JPKWIC - GENERAL KEY WORD IN CONTEXT AND SUBJECT INDEX REPORT GENERATOR JIRKA, R. KABASHIMA, N. KELLY, D. PLESSET, M. DATE- JUN. 1968 NPO-10589

JPKWIC computer program is a general key word in context and subject index report generator specifically developed to help nonprogrammers and nontechnical personnel to use the computer to access files, libraries and mass documentation. This program is designed to produce a KWIC index, a subject index, an edit report, a summary report, and an exclusion list.

COMPUTER PROGRAM DETERMINES SYSTEM

STABILITY /DIGSTA/ LORENZO, C. F. SCALZOTT, L. L. DATE- JUN. 1968 LEWIS-10395

Computer program implements a stability criterion that can be applied directly to the numerical solutions of systems of differential equations. The program accepts as input the time function of the system, a time to view the transient, and an acceptable amplitude boundary for any steady-state oscillation.

B68-10217 COMPUTER PROGRAM OFFERS NEW METHOD FOR CONSTRUCTING PERIODIC ORBITS IN NONLINEAR DYNAMICAL SYSTEMS DATE- JUN. 1968
M-FS-14654

Computer program uses an iterative method to construct precisely periodic orbits which dynamically approximate solutions that converge to precise dynamical solutions in the limit of the sequence. The method used is a modification of the generalized Newton-Raphson algorithm used in analyzing two point boundary problems.

B68-10226 COMPUTER PROGRAM ANALYZES BUCKLING OF SHELLS OF REVOLUTION WITH VARIOUS WALL CONSTRUCTIONS, BOSOR
ALMROTH, B. O. BUSHNELL, D. SOBEL, L. H.
/LOCKHEED MISSILES AND SPACE CO./ DATE- JUN. LANGLEY-10290

Computer program performs stability analyses for a wide class of shells without unduly restrictive approximations. The program uses numerical integration, finite difference of finite element techniques to solve with reasonable accuracy almost any buckling problem for shells exhibiting orthotropic behavior.

SEAL /SUBNETWORK ENUMERATION AND LISTING/ HAPP, W. W. MC INTOSH, F. J. DATE- JUN. 1968 ERC-10116

C-10116
SEAL /Subnetwork Enumeration And Listing/
computer program uses combinatorial techniques to
generate all of the nonredundant subnetwork
configurations derivable from an asymmetrical
network or device. This is accomplished by a
systematic shorting and opening of accessible
terminals to obtain the desired allowable configurations.

B68-10232 HICOV /NEWTON-RAPHSON CALCULUS OF VARIATION WITH AUTOMATIC TRANSVERSALITIES/ HEINTSCHEL, T. J. /GE/ DATE- JUL. 1968

Computer program generates trajectories that are orbinum with respect to payload placed in an earth orbit. It uses a subroutine package which produces the terminal and transversality conditions and their partial derivatives. This program is written in FORTRAN 4 and FORMAC for the IBM 7094 computer.

B68-10287 DEVELOPMENT OF ELECTRONIC DATA PROCESSING /EDP/-AUGMENTED MANAGEMENT SYSTEM
SCOTT, J. E. WADDLETON, T. R. /BOEING CO./
DATE- AUG. 1968 M-FS-14715

To tailor the existing Unified Flight Analysis
System to management data rather than technical
data, a pilot model could be produced in
\*\*breadboard\*\* form, using electronic data
processing, in a matter of a few months at very
moderate cost. Such a system lends itself to continuous refinement.

B68-10292 LINEAR SYSTEMS OF EQUATIONS SOLVED USING MATHEMATICAL ALGORITHMS BAREISS, E. H. DATE- AUG. 1968 SEE ALSO ANL-7213

New mathematical algorithm solves linear systems of equations, AX equals B, and preserves the integer properties of the coefficients. The algorithms presented can also be used for the efficient evaluation of determinates and their leading minors.

B68-10296 COMPUTER GRAPHICS DATA CONDITIONING
HAGENAU, K. H. MC MILLEN, G. C. /BOEING CO./
DATE- AUG. 1968
M-FS-14695

Graphics data conditioning program expedites engineering analysis of flight data and ensures timely correction of measurement errors. By adding interactive computer graphic displays to existing data conditioning programs, computational results are immediately visible, enabling on-line intervention and control of computer processing.

COMPUTER PROGRAM ANALYZES AND DESIGNS SUPERSONIC WING-BODY COMBINATIONS WOODWARD, F. A. /BOEING CO./ DATE- SEP. 1968 ARC-10141

Computer program formulates geometric description of the wing body configuration, optimizes wing camber shape, determines wing shape for a given pressure distribution, and calculates pressures, forces, and moments on a given configuration. The program consists of geometry definition, transformation, and paneling, and aerodynamics, and flow visualization.

FORTRAN OPTICAL LENS DESIGN PROGRAM FIRNETT, P. J. SCHMIDT, L. F. WILSON, L. A. /INFORMATICS, INC./ DATE- SEP. 1968 NPO-10603

J-10603
Computer program uses the principles of geometrical optics to design optical systems containing up to 100 planes, conic or polynomial aspheric surfaces, 7 object points, 6 colors, and 200 rays. This program can be used for the automatic design of optical systems or for the evaluation of existing optical systems.

B68-10356 ANALYSIS OF ANNULAR COMBUSTORS INNOVATOR NOT GIVEN /NORTHERN RES. ENG. CORP./ DATE- SEP. 1968 SEE ALSO NASA-CR-72374 AND NASA-CR-72375 LEWIS-10399

Computer program is used for analysis and design of gas turbine combustors. The program analyzes fluid flow, combustion, and heat transfer in annular and rectangular combustors with diffusers, making use of currently available analytical methods and correlations.

REAL FLUID PROPERTIES OF NORMAL AND PARAHYDROGEN GOLDBERG, F. N. HAFERD, A. M. DATE- SEP. 1968 LEWIS-10458 Computer program calculates the real fluid

properties of normal or parahydrogen using a library of single function calls without initial estimates. Accurate transport and thermodynamic properties of molecular hydrogen are needed for advanced propulsion systems.

B68-10374 AXISYMMETRIC TWO-PHASE PERFECT GAS AXISTMEINIC IND-PHASE PERFECT GAS
PERFORMANCE PROGRAM
KLIEGEL, J. R. NICKERSON, G. R. /TRW SYSTEMS/
DATE- OCT. 1968 SEE ALSO B68-10375,
B68-10376, AND B68-10377 MSC-11774

Computer program calculates the inviscid axisymmetric nozzle expansion of propellant systems having both gaseous and condensed exhaust products. The program uses velocity and thermal

lags and will perform calculations for contoured and conical nozzles.

B68-10375
ONE-DIMENSIONAL REACTING GAS NONEQUILIBRIUM
PERFORMANCE PROGRAM
FREY, H. M. KLIEGEL, J. R. /TRW SYSTEMS/ DATEDCT. 1968 SEE ALSO B68-10374, B68-10376,
AND B68-10377
MSC-11777

Computer program calculates the inviscid one-dimensional equilibrium, frozen, and nonequilibrium nozzle expansion of gaseous propellant exhaust mixtures containing the elements - carbon, hydrogen, oxygen, nitrogen, fluorine and chlorine. The program performs calculations for conical nozzles only.

B68-10376
ONE-DIMENSIONAL TWO-PHASE REACTING GAS
NONEQUILIBRIUM PERFORMANCE PROGRAM
CHERRY, S. S. FREY, H. M. KLIEGEL, J. R. QUAN
V. /TRW SYSTEMS/ DATE- OCT. 1968 SEE ALSO
B68-10374, B68-10375, AND B68-10377
MSC-11780

Computer program calculates the inviscid one-dimensional equilirium, frozen, and nonequilibrium nozzle expansion of propellant exhaust mixtures containing carbon, hydrogen, oxygen, nitrogen, fluorine, chlorine and either aluminum, beryllium, boron or lithium. This program performs calculations for conical nozzles only.

B68-10377
AXISYMMETRIC REACTING GAS NONEQUILIBRIUM
PERFORMANCE PROGRAM
KLIEGEL, J. R. MELDE, J. E. NICKERSON, G. R.
QUAN, V. /TRW SYSTEMS/ DATE- DCT. 1968
SEE ALSO B68-10374, B68-10375, AND B68-10376
MSC-11781

Computer program calculates the inviscid one-dimensional equilibrium, frozen, and nonequilibrium nozzle expansion of propellant exhaust mixtures containing these six elements - carbon, hydrogen, oxygen, nitrogen, fluorine, and chlorine plus either aluminum, beryllium, boron or lithium. This program will perform calculations for contoured and conical nozzles.

B68-10403
INTERNAL VELOCITY FACTORS
CATHCART, J. R. FRANK, A. J. MASSAGLIA, J. L.
/N. AM. ROCKWELL CORP./ DATE- NOV. 1968
MSC-15002

Computer program analyzes the entries and planetary trajectories of space vehicles. It obtains the equivalence of altitude and flight path angle, respectively, to acceleration load factor with respect to velocity for a given inertial velocity.

B68-10405
ANALYSIS OF FILAMENT REINFORCED METAL-SHELL
PRESSURE VESSELS
LANDES, R. E. MORRIS, E. E. /AEROJET GEN. CORP./
DATE-NOV. 1968
LEWIS-10352

Computer program analyzes design requirements and computes designs for metal-lined filament-wound pressure vessels with either geodesic /helical/ or in-plane filament winding patterns on the cylindrical portion and over the ends, reinforced by circumferential windings on the cylindrical portion.

B68-10410
DSN SEVEN DAY/TWELVE WEEK SCHEDULE PROGRAM
HOLZMAN, R. E. DATE- DEC. 1968
NPO-10752

Deep Space Network scheduling program allocates resources based on the user\*s requirements. The system reviews and allocates the requests for equipment and resources. Depending upon the program input either the seven day or the twelve week schedule is generated.

B68-10416 CIRCUS--A DIGITAL COMPUTER PROGRAM FOR TRANSIENT ANALYSIS OF ELECTRONIC CIRCUITS MODRE, W. T. STEINBERT, L. L. /BOEING CO./DATE-DEC. 1968 M-FS-15002

Computer program simulates the time domain response of an electronic circuit to an arbitrary forcing function. CIRCUS uses a charge-control parameter model to represent each semiconductor device. Given the primary photocurrent, the transient behavior of a circuit in a radiation environment is determined.

B68-10421 COMPUTER PROGRAM FOR MACHINE DESIGN OF CASSEGRAIN FEED SYSTEMS POTTER, P. D. DATE- NOV. 1968 NPO-10588

Program designs the feed system geometry and the subreflector surface, with the main reflector configuration and frequency of operation as input data. Although the feedhorn is not designed, its required gain, beamwidth, and approximate radiation pattern are specified.

B68-10422
GENERALIZED NEWTON-RAPHSON TRAJECTORY
OPTIMIZATION-GENERATOR 1
COPE, D. D. ESKRIDGE, C. D. HANAFY, L. M.
/BOEING CO./ DATE- NOV. 1968
M-FS-15020

Computer program constructs a sequence of optimal solutions to dynamically-approximate linear equations. Specification of the number and type of subarcs in the optimal solution allows simultaneous satisfaction of all switching criteria.

B68-10423
SYMBOLIC REDUCTION OF BLOCK DIAGRAMS
USING FORMAC
LORENZO, C. F. SWIGERT, P. DATE- NOV. 1968
LEWIS-10409

Two computer programs - one written in FORMAC to generate the desired symbolic expressions, the other in FORTRAN 4 to numerically evaluate the expressions are announced. The FORTRAN program accepts the symbolic punched output from the FORMAC program in either unexpanded or expanded form. It numerically evaluates the expressions.

B68-10435
GERT EXCULSIVE-OR COMBINING PATHS AND
LOOPS OF ELECTRICAL NETWORKS
ALAN, A. PRITSKER, B. /ARIZONA STATE UNIV./
DATE- OCT. 1968
ERC-10206

C-10206
Program takes a network with multi-parameter branches and reduces it to a network having a single branch connecting source nodes to sink nodes. The program calculates probability, expected time, and variance in the time to go from each source node to each sink node of the GERT network.

B68-10445
ENVIRONMENTAL TEST PLANNING, SELECTION
AND STANDARDIZATION AIDS AVAILABLE
COPELAND, E. H. FOLEY, J. T. DATE- DEC. 1968
SAN-10028

Requirements for instrumentation, equipment, and methods to be used in conducting environmental tests on components intended for use by a wide variety of technical personnel of different educational backgrounds, experience, and interests is announced.

B68-10446
MODIFIED MULTHOPP MEAN CAMBER COMPUTER
PROGRAM
LAMAR, J. E. DATE- DEC. 1968
LANGLEY-10376

Computer program which determines the mean camber surface required to support a given set of loadings on a composite wing in subsonic compressible flow has been developed.

B68-10447 PLUME RADIATION PROGRAM DE SOTO, S. VOK, C. A. /N. AM. ROCKWELL CORP./ DATE- OCT. 1968 M-FS-13202

> Computer program determines the radiant flux to the base region of a real gas system with an axisymmetric geometry and any axisymmetric property distribution.

B68-10448
PERFORMANCE ANALYSIS OF ELECTRICAL CIRCUITS
/PANE/
JOHNSON, K. L. STEINBERG, L. L. /BOEING CO./
DATE- OCT. 1968
M-FS-15001

Automated statistical and worst case computer program has been designed to perform d.c. and a.c. steady circuit analyses. The program determines the worst case circuit performance by solving circuit equations.

B68-10449
SINGLE DEGREE OF FREEDOM ANTENNA POINTING
PROGRAM /ANTENNA/
FLEISHHER, G. E. DATE- NOV. 1968
NPO-10756

Computer program optimizes the accuracy of pointing a radio-frequency antenna at a target whose position is time varying but known with respect to a certain reference frame.

B68-10450
COMPUTER PROGRAM TRACK PERFORMS TRANSIENT
AND/OR STEADY STATE THERMAL ANALYSIS WITH
COUPLED FLUID FLOW AND HEAT CONDUCTION
LEE, A. Y. WOODS, M. D. WOODS, H. D.
/WESTINGHOUSE ASTRONUCL. LAB./ DATE- NOV. 1968
NUC-10189

Computer program called TRACK was developed by combining a transient fluid flow computer code and the existing modified TOSS heat conduction code to perform the computation.

B68-10451 A REQUEST-ORIENTED INFORMATION SELECTION PROGRAM RYAN, E. DATE- OCT. 1968 LEWIS-10255

General purpose information retrieval program written entirely in FORTRAN 4 was developed and can be used with any file of fixed format documents. This program is easily used by noncomputer personnel and provides flexibility in search requests and output format.

B68-10452 MODIFIED MULTHOPP LIFTING SURFACE LOADING PROGRAM LAMAR, J. E. DATE- NOV. 1968 LANGLEY-10375

Computer program determines the longitudinal subsonic aerodynamic characteristics of composite wings. The program uses the basic theoretical method of Multhopp in predicting the loading data.

B68-10453 COMPUTER PROGRAM FOR PARAMETER OPTIMIZATION GLATT, C. R. HAGUE, D. S. /BOEING CO./ DATE-DEC. 1968 ARC-10168

Flexible, large scale digital computer program was designed for the solution of a wide range of multivariable parameter optimization problems. The program has the ability to solve constrained optimization problems involving up to one hundred parameters.

B68-10457
GERT-SIMULATION PROGRAM FOR GERT NETWORK
ANALYSIS
ALAN, A. PRITSKER, B. /ARIZONA STATE UNIV./
DATE- OCT. 1968
ERC-10209

GERT Simulation Program simulates GERT networks to obtain statistics on specified nodes of the network. It performs sampling experiments to determine which branches of the network are taken and how long it takes to traverse a branch of the network.

B68-10576
DIGITAL COMPUTER TECHNIQUE FOR SETUP AND CHECKOUT OF AN ANALOG COMPUTER AMBARUCH, R. /IBM/ DATE- NOV. 1968
M-FS-13969

Computer program technique, called Analog
Computer Check-Out Routine Digitally
/ACCORD/, generates complete setup and checkout
data for an analog computer. In addition, the
correctness of the analog program implementation
is validated.

Issue 8

Subject Index			Acceleration insensitive fluid expan	nsion	
The title of each Tech Brief is listed under several selected subject headings to provide the user with a variety of approaches in his search for specific information. The Tech Brief number, e.g., B68-10148, is located under and to the right of the title and is followed by a two-digit number,			compensator ERC-10152	B68-10559	01
			ACCEPTABILITY Failure rates for accelerated acceptan		
e.g., 05, which designates the subject category in which t can be found.			testing of silicon transistors ERC-10198	B68-10541	01
			ACCESSORIES Versatile impact hand tool M-FS-20140	B68-10371	05
			ACCUMULATORS Accumulator for shaft encoder M-FS-13599	B68-10093	01
			ACCURACY Synchronized circuit improves accur fluid transfer measurements	acy of	
			MSC~11167	B68-10057	05
ABLATIVE MATERIALS			ACETATES Study of behavior of sterols at int ARG-10085	erfaces B68-10281	03
Fire retardant foams developed to se fuel fires			ACETONE	_	
ARC-10098 ABSORBERS (EQUIPMENT)	B68-10358	03	Viscosity and density of methanol/w mixtures at low temperatures M-FS-14991	B68-10274	03
Pressure variable orifice for hydra- control valve	ulic		ACIDS		
MSC-11323	B68-10120	05	High-temperature bearing lubricants LEWIS-10408	B68-10249	05
ABSORPTION Microprobe investigation of brittle segregates in aluminum MIG and TI M-FS-14720		03	ACOUSTIC ATTENUATION  Power consumption in acoustic ampli under conditions of maximum stabl	e gain	0.1
ABSORPTION SPECTRA			GSFC-10067	B68-10327	01
Infrared spectroradiometer for rock exhaust analysis M-FS-14357	et B68-10081		Improved communication system for l operations center M-FS-15016	B68-10529	01
				•	
Optimetric system facilitates color and fluorometric measurements NPO-10233	B68-10316	01	ACOUSTIC MEASUREMENTS Noise figure measurement concept fo acoustic amplifiers		0.1
Miniaturized King furnace permits			GSFC-10066	B68-10272	01
absorption spectroscopy of small ARG-10177	B68-10418	S0	ACOUSTIC VELOCITY  Ultrasonic temperature measuring de  LEWIS-10446	vice B68-10319	01
ABSORPTIVITY Properties of optics at high temper	ature and		ACQUISITION		
their measurement, a study M-FS-14696	B68-10240	20	Acquisition of pseudonoise signals sequential estimation	B68-10258	01
AC GENERATORS Method for measuring alternator vol	tage		M-FS-13898  Design concept for a rapid automati		0,1
transients LEWIS-10373	B68-10513	01	acquisition system NPO-10214	B68-10428	01
ACCELERATION Internal velocity factors MSC-15002	B68-10403	06	ACTINIDE SERIES COMPOUNDS  Nitric acid-organic mixtures survey  use in separation by anion exchan	ige methods	
ACCELERATION (PHYSICS)			ARG-10065	B68-10425	03
Advances in light-gas gun technolog M-FS-14270	B68-10288	05	ACTIVATION Preparation of silver-activated zin thin films		
ACCELEROMETERS Mass loading effects on vibrated ri	ng and		GSFC-10687	B68-10271	0:
shell structures M-FS-14979	B68-10532	03	Versatile impact hand tool M-FS-20140	B68-10371	0

ACTUATORS			M-FS-12218	B68-10225	05
Quick-attach clamp XFR-05421	B68-10250	. 05	AERODYNAMIC CHARACTERISTICS  Modified Multhopp lifting surface 1	oading	
High-voltage pulse generator develo		0.1	program LANGLEY-10375	B68-10452	06
ARG-10136  Conceptual hermetically sealed elboactuator M-FS-14710	B68-10283 W B68-10300	01	AERODYNAMIC COEFFICIENTS  Computer program analyzes and desig  supersonic wing-body combinations  ARC-10141		06
Conceptual apparatus for detecting		05	Modified Multhopp mean camber compu		
nonconductive liquids M-FS-14713	B68-10303	01	program LANGLEY-10376	B68-10446	06
Indium adhesion provides quantitati measure of surface cleanliness SAN-10024	B68-10342	01	AERODYNAMIC CONFIGURATIONS Computer program analyzes and desig supersonic wing-body combinations ARC-10141		06
Automatic patient respiration failu detection system with wireless tr ARC-10174		01	AERODYNAMICS  Computer program analyzes and desig supersonic wing-body combinations		
Pyrotechnic-actuated cable release XNP-10849	B68-10535	05	ARC-10141 AEROSPACE ENGINEERING	B68-10335	06
ADAPTERS Multichannel wireway adapter box MSC-90645	B68-10052	05	Improved electro-optical tracking s M-FS-14791	ystem B68-10311	01
Tensile testing grips ensure unifor of bimetal tubing specimens LEWIS-10267	m loading B68-10248	05	AEROSPACE ENVIRONMENTS Standards for compatibility of prin circuit and component lead materi M-FS-14531		01
High-torque power wrench, a concept M-FS-18194	B68-10299	05	AEROSPACE SYSTEMS Fiberglass-reinforced structural ma for aerospace application		
ADDING CIRCUITS  Self-correcting, synchronizing ring using integrated circuit devices M-FS-13901	counter B68-10067	01	M-FS-14806  AGE FACTOR Study of radiation effects on mamma	B68-10360	03
ADDITIVES	0		in vitro ARG-10191	B68-10294	02
High-temperature bearing lubricants LEWIS-10408  Ignition of binary alloys of uraniu	B68-10249	05	AGING (METALLURGY) Stress-corrosion characteristics of casting alloy M-45		
ARG-10057  Precise doping of metals by small g	B68-10280 as flows	01	M-FS-14817 Resistivity measurements of	B68-10184	03
LEWIS-10444 Adhesion	B68-10526	03	neutron-irradiated pure metals an alloys ARG-10108	d Al-Zn B68-10200	03
Method of disjoining adhesively bon electronic cordwood modules	ded		AIR	700 10200	•••
MSC-12060	B68-10086	01	High conductance vapor thermal swit GSFC-10109	ch B68-10519	02
Indium adhesion provides quantitati measure of surface cleanliness SAN-10024	Ve B68-10342	01	AIR FLOW Vacuum probe sampler removes micron	-sized	
ADHESIVES			particles from surfaces SAN-10003	B68-10231	04
Miniature pressure transducer for s member application	tressed B68-10246		Modified sine bar device measures s angles with high accuracy	mall	
MSC-11869  Fiberglass-reinforced structural ma		01	GSFC-438	B68-10322	20
for aerospace application M-FS-14806	B68-10360	03	Analysis of annular combustors LEWIS-10399	B68-10356	06
Improved radiographic image amplifi M-FS-14522	er panel B68-10363	02	Automatic patient respiration failu detection system with wireless tr ARC-10174		01
High-emittance coatings on metal su LEWIS-10325	B68-10381	03	An investigation of particle mixing gas-fluidized bed	in a	
Battery-package design provides for cooling and constraint			ARG-10182	B68-10407	05
MSC-11839 ADSORPTIVITY	B68-10398	05	Combination probe for airflow measu LEWIS-10281	rements B68-10558	01,
Computer program calculates and plo surface area and pore size distri	bution data		AIR POLLUTION Repetitively pulsed, wavelength-sel	ective	
GSFC-10362 AERODYNAMIC BALANCE	B68-10009	06	carbon dioxide laser ERC-10178	B68-10564	02
Laser system used for dynamic balar gyros	cing of		AIRCRAFT Communication system features dual	mode	

SUBJECT INDEX ALUMINUM ALLOYS

range acquisition plus time del measurement M-FS-14323	B68-10306	01	ALUMINUM  Laminated sheet composites reinforced with  modular filament sheet  M-FS-14575  B68-10146	03
AIRCRAFT DESIGN Modified Multhopp lifting surface	loading		M-FS-14575 B68-10146 Study reveals effect of aluminum on	03
program LANGLEY-10375	B68-10452	06 -	saturation moment of Fe-Ni alloys ARG-90259 B68-10172	03
AIRCRAFT INSTRUMENTS	• • • • • • • • • • • • • • • • • • • •		Conceptual dead weight device to provide	
Alternating current electromagnet induction meter XFR-03838	B68-10100	01	pressure calibration M-FS-14672 B68-10264	01
ALCOHOLS	B08-10100	01	Thermal protective visor for entering	
Preparation of silver-activated z thin films			high temperature areas MSC-10285 B68-10277	05
GSFC-10687	B68-10271	03	Isotopically pure magnesium isotope-24 is prepared from magnesium-24 oxide	
ALGAE The preparation, identification a	nd		ARG-10154 B68-10293	02
properties of chlorophyll deriv ARG-10205	B68-10409	03	Improved electro-optical tracking system M-FS-14791 B68-10311	01
ALGORITHMS Digital filter synthesis computer	neanoan		Compressible sleeve provides automatic centering for grinding or turning of	
ARC-10130	B68-10164	06	cylinders SAN-10021 B68-10318	05
Linear systems of equations solve mathematical algorithms	=		Microprobe investigation of brittle	
ARG-10146	B68-10292	06	segregates in aluminum MIG and TIG welds M-FS-14720 B68-10334	03
Computer program for parameter optimization ARC-10168	B68-10453	06	X-ray film holder permits single continuous picture of tubing joint	
ALIGNMENT			LEWIS-10382 B68-10343	05
Laser Doppler gas-velocity instru M-FS-20039	ment B68-10349	92	Nickel base alloy with improved stress rupture properties LEWIS-10283 B68-10344	03
Machining technique prevents unde in tensile specimens	rcutting		One-dimensional two-phase reacting gas	
LANGLEY-10281	B68-10352	05	nonequilibrium performance program MSC-11780 B68-10376	06
High-torque precision stepping dr M-FS-14772	B68-10549	05	Heat-load simulator for heat sink design MSC-15170 B68-10510	02
ALKALI METALS Precise doping of metals by small LEWIS-10444	gas flows B68-10526	03	ALUMINUM ALLOYS  Mechanical shielding reduces weld surface	
ALKALINE BATTERIES			cracking in 6061 T6 aluminum MSC-11494 B68-10022	05
Battery~package design provides f cooling and constraint			Study of crack initiation phenomena	
MSC-11839	B68-10398	05	associated with stress corrosion of aluminum alloys	
Separator for alkaline batteries GSFC-10173	B68-10557	03	M-FS-14283 B68-10153	03
ALLOYS			Stress-corrosion characteristics of aluminum casting alloy M-45	
Twin solution calorimeter determi heats of formation of alloys at			M-FS-14817 B68-10184	03
temperatures ARG-10114	B68-10083	01	Welding of commercial base plates is investigated	
High temperature alloy			M-FS-13649 B68-10192	03
LEWIS-10377  Dual wire weld feed proportioner	B68-10253	03	Resistivity measurements of neutron-irradiated pure metals and Al-Zn alloys	
M-FS-18037	B68-10332	05	ARG-10108 B68-10200	03
Electromotive series established	for metals		Effects of surface preparation on quality	
used in aerospace technology M-FS-18327	B68-10385	03	of aluminum alloy weldments M-FS-13152 B68-10302	03
ALTERNATING CURRENT			Fiberglass-reinforced structural materials	
Precision bolometer bridge MSC-11473	B68-10156	01	for aerospace application M-FS-14806 B68-10360	03
Semiconductor ac static power sw LEWIS-10344	itch B68-10224	01	Tungsten fiber-reinforced nickel superalloy LEWIS-10424 B68-10369	03
Analysis and design of a class-D M-FS-14803	amplifier B68-10313	01	Effects of high frequency current in welding aluminum alloy 6061	
Concept to convert electrical por			M-FS-18337 B68-10383	05
GSFC-10222	B68-10321	01	Improved thermal treatment of aluminum alloy 7075 M-FS-20083 B68-10534	05

ALUMINUM OXIDES SUBJECT INDEX

A rapid stress-corrosion test for a alloys	aluminum		AMPLIFIER DESIGN Amplifier improvement circuit		
M-FS-20175	B68-10536	03	LEWIS-10712	B68-10456	01
Weld joint strength and mechanical in 2219-T81 aluminum alloy LEWIS-10479	properties B68-10561	03	Active RC filter permits easy trade- of amplifier gain and sensitivity ARC-10042		01
Stress-corrosion-induced property of in aluminum alloys M-FS-20209	hanges B68-10568	03	AMPLIFIERS Input gate circuit converted for use linear amplifier	e as	
ALUMINUM OXIDES			M-FS-14265	B68-10015	01
Multichip packaging with thermal in M-FS-14076	sulation B68-10119	92	Improved traveling wave maser amplif NPO-10548	fier B68-10244	01
Manganese-alumina-ceramic glass el rigid controls necessary in bondi to ceramics	ing metals		Noise figure measurement concept for acoustic amplifiers GSFC-10066	r B68-10272	01
SAN-10012	B68-10204	03	Viscosity and density of methanol/wa	ater	
Characteristics of fluidized-packed ARG-10049	l beds B68-10278	03	mixtures at low temperatures M-FS-14991	B68-10274	03
Isotopically pure magnesium isotope prepared from magnesium-24 oxide ARG-10154		02	Analysis and design of a class-D amp M-FS-14803	plifier B68-10313	01
New bimetallic EMF cell shows promi direct energy conversion	ise in		Temperature or pressure controller LEWIS-10297	B68-10337	01
ARG-10183  High dielectric thick films for scr	B68-10415	01	Improved radiographic image amplific M-FS-14522	er panel B68-10363	02
circuit capacitors LANGLEY-10294	B68-10542	01	Improved communication system for la operations center	arge	
	100-10042	01	M-FS-15016	B68-10529	01
AMBIENT TEMPERATURE Improved atomic resonance gas cell in frequency standards MSC-11666	for use B68-10230	01	Active RC filter permits easy trade- of amplifier gain and sensitivity ARC-10042		01
Fluidic-thermochromic display device ERC-10031		01	Design of dissipative linear phase 1 M-FS-14698		01
AMBULANCES Electrocardiograph transmitted by F telephone links in emergency situ			AMPLITUDE MODULATION Facsimile video enhancement device GSFC-10185	B68-10207	01
FRC-10031 AMERICIUM	B68-10233	01	Synthesis of electro-optic modulator amplitude modulation of light	rs for	
Portable, high intensity isotopic r source provides increased experin			M-FS-14268	B68-10275	20
accuracy ARG-90250	B68-10243	02	Improved limiter for turn-on current transient GSFC-10413	т В68-10384	01
AMERICIUM 241 Detection sensitivities in 3-8 MeV			AMPLITUDES		
neutron activation ARG-10210	B68-10298	02	Amplitude and frequency readout over GSFC-10183	rlay B68-10054	01
AMINO ACIDS Rate constants measured for hydrate electron reactions with peptides			Large-amplitude inviscid fluid motio accelerating container MSC-11560	on in an B68-10170	02
proteins					02
ARG-10195 AMMONIA	B68-10424	04	Electro-optic modulator for infrared using gallium arsenide crystal GSFC-10686	B68-10255	02
Preparation of silver-activated zir thin films GSFC-10687	nc sulfide B68-10271	03	ANALOG COMPUTERS Digital computer technique for setup	p and.	
AMMONIUM COMPOUNDS  Ceric and ferrous dosimeters show p	recision		checkout of an analog computer M-FS-13969	B68-10576	06
for 50-5000 rad range ARG-10173	B68-10426	02	ANALOG DATA Dynamic linearity measurement techni KSC-10186	i que B68-10290	01
AMOEBA Stratification of centrifuged amoet investigated by electron microsco ARG-10161		04	ANALOG SIMULATION Rocket engine analog simulation M-FS-14511	B68-10511	01
AMPLIFICATION  Electrocardiograph transmitted by F  telephone links in emergency situ			ANALOG TO DIGITAL CONVERTERS Linear analog dc voltage-to-pulse-wi	idth	
FRC-10031	B68-10233	01	GSFC-556	B68-10003	01
Amplifier improvement circuit LEWIS-10712	B68-10456	01	Small, low power analog-to-digital converter M-FS-13954	B68-10016	01

High resolution Ge /Li/ spectromete reduces rate-dependent distortion			Consolidation and fabrication techn for vanadium-20 w/o titanium /TV-	20/	
counting rates ARG-10144	B68-10420	01	ARG-10148	B68-10368	03
AKG-10144	B08-10450	01	Inverted grounding technique for ele	ectron	
Automatic calibration apparatus for			beam heating		
telemetry systems NPO-10560	B68-10514	01	LEWIS-10543	B68-10411	01
	200 20021		Conditioning flat conductors for fla	at	
ANALYSIS (MATHEMATICS)			conductor cable production		
Design techniques - Stochastic cont MSC-11554	rollers B68-10234	02	M-FS-14914	B68-10429	01
	200 20201	72	ANNULI		
New method for critical failure pre-	diction		Analysis of annular combustors	B68-10356	0.0
of complex systems M-FS-14133	B68-10252	02	LEWIS-10399	B00-10350	06
			ANODES		
ANALYTICAL CHEMISTRY			Application of the solid lubricant molybdenum disulfide by sputtering	_	
Product identification techniques u- training aids for analytical chem			LEWIS-10544	9 B68-10340	03
SAN-10025	B68-10373	03			
ANALYGONG			Inverted grounding technique for el	ectron	
ANALYZERS Analytical techniques for determini	na boron		beam heating LEWIS-10543	B68-10411	01
in graphite	-				
ARG-10087	B68-10102	03,	ANODIZING		
Welder analyzer			Effects of surface preparation on q of aluminum alloy weldments	uaiity	
MSC-12068	B68-10242	01	M-FS-13152	B68-10302	03
W			ANTENNA RADIATION PATTERNS		
Harmonic distortion analyzer speeds magnetic tape recorders	setup of		Computer program for machine design	of	
GSFC-10198	B68-10254	01	Cassegrain feed systems		
AN ALYZING			NPO-10588	B68-10421	06
Hastelloy X properties, data, and			ANTENNAS		
metallurgical characteristics			Diversity RF receiving system with		
NUC-10302	B68-10023	03	improved phase-lock characteristi XGS-01222	cs B68-10068	01
Microprobe investigation of brittle			VG2. 01555	DOD TOUGO	. • •
segregates in aluminum MIG and TI M-FS-14720		03	Astronaut space suit communication MSC-12101	antenna B68-10238	01
ANEMOMETERS			Deep space FM system, a concept		
Fast-response cup anemometer featur	es		MSC-11825	B68-10289	01
cosine response ARG-90193	B68-10202	01	High-torque precision stepping driv	e	
			M-FS-14772	B68-10549	05
Compact rotating cup anemometer NPO-10563	B68-10436	01	ANTIFRICTION BEARINGS		
NF0-10303	D00-10450	01	Low friction servo valve		
ANGLES (GEOMETRY)			LEWIS-10574	B68-10440	05
Flare angles measured with ball gag M-FS-14690	e B68-10030	01	Fluid power-transmitting gas bearin	·α	
			. ERC-10097	B68-10503	05
Modified sine bar device measures s angles with high accuracy	mall		ANTIRADIATION DRUGS		
GSFC-438	B68-10322	02	Experimental study and evaluation o	f	
			radioprotective drugs		
ANGULAR VELOCITY Gimbal angle sensor			ARG-10196	B68-10320	04
GSFC-10305	B68-10315	01	APERTURES		
			Electronic aperture control devised	for	
ANIMALS  Experimental study and evaluation o	f		solid state imaging system M-FS-12428	B68-10028	01
radioprotective drugs	•		15 15165	200 20020	
ARG-10196	B68-10320	04	Electro-optic modulator for infrare	d laser	
ANIONS			using gallium arsenide crystal GSFC-10686	B68-10255	02
Nitric acid-organic mixtures survey					
use in separation by anion exchan ARG-10065	ge methods B68-10425	03	APOLLO PROJECT  New method for critical failure pre	diation	
NRG-10003	D00-10423	V3	of complex systems	alction	
ANISOTROPY			M-FS-14133	B68-10252	02
Ignition of binary alloys of uraniu ARG-10057	m B68-10280	01	APPLICATIONS OF MATHEMATICS		
and 10007	DOG 10200	01	Controllability of distributed-para	meter	
Study of behavior of sterols at int		4.5	systems	DC0 10746	00
ARG-10085	B68-10281	03	M-FS-14929	B68-10346	02
Correction for losses in optical			APPROXIMATION		
birefringent networks, a concept	DC0_10571	0.2	The X square statistic and goodness	of fit .	
M-FS-20088	B68-10571	02	test GSFC-10547	B68-10136	02
ANNEALING					_
Weld microfissuring in Inconel 718 minimized by minor elements			Independent doubly truncated gamma M-FS-20143	variables B68-10345	02
minimized by minor elements M-FS-18185	B68-10251	03	11 10 20140	200 10040	76

ARC DISCHARGES System measures arc energy dissipated in		ATTENUATORS Laser Doppler gas-velocity instrument	
relay contact cycling M-FS-14541 B68-103	12 01	M-FS-20039 B68-10349	02
ARGON		AUDITORY SIGNALS Conceptual apparatus for detecting leaks of	
Reducing bubbles in glass coatings improves electrical breakdown strength		nonconductive liquids M-FS-14713 B68-10303	01
LEWIS-10278 B68-102	14 03	Automatic patient respiration failure	
Laser Doppler gas-velocity instrument M-FS-20039 B68-1034	49 02	detection system with wireless transmission ARC-10174 B68-10365	01
ARITHMETIC AND LOGIC UNITS Digital data averager improves conventional		AUTOCATALYSIS Ignition of binary alloys of uranium	
measurement system performance MSC-12078 B68-100	18 01	ARG-10057 B68-10280	01
ARMATURES	10 01	AUTOMATIC CONTROL	
High-torque power wrench, a concept	00 05	Recharge unit provides for optimum recharging of battery cells	
M-FS-18194 B68-1029	99 05	GSFC-10688 B68-10273	01
Improved electromechanical master-slave manipulator		Dual wire weld feed proportioner M-FS-18037 B68-10332	05
ARG-10027 B68-1037	72 05	Closed circuit TV system automatically	
ASBESTOS Asbestos and Inconel combined to form hot-g	as	guides welding arc M-FS-20084 B68-10357	01
seal M-FS-14004 B68-101	62 05	Automatic patient respiration failure	
ASSEMBLING		detection system with wireless transmission ARC-10174 B68-10365	01
Miniature paint-spray gun for recessed areas		Automatic system nondestructively monitors	
MSC-13060 B68-1036	87 05	and records fatigue crack growth LANGLEY-10091 B68-10379	01
ASTRONAUTS Astronaut space suit communication antenna		Automatic calibration apparatus for	
MSC-12101 B68-102	38 01	telemetry systems NPO-10560 B68-10514	01
Food products for space applications MSC-11697 B68-103;	24 04	Telescope dome control system automatically	••
	24 04	tracks sun	
ASTRONOMICAL OBSERVATORIES Feasibility study of wireless power		MSC-10966 B68-10521	02
transmission systems M-FS-14691 B68-103	09 01	Welding skate with computerized controls M-FS-20224 B68-10566	01
ASYMMETRY		AUTOMATIC CONTROL VALVES	
SEAL /Subnetwork Enumeration And Listing/		Low friction servo valve LEWIS-10574 B68-10440	05
ERC-10116 B68-1027	27 06	AUTOMATION	
ASYMPTOTIC METHODS  Dynamics of moving bubbles in single and		Microprobe investigation of brittle segregates in aluminum MIG and TIG welds	
binary component systems M-FS-14845 B68-103	39 02	M-FS-14720 B68-10334	03
ATOMIC STRUCTURE	02	AUXILIARY POWER SOURCES	
Study reveals effect of aluminum on		Zinc-oxygen primary cell yields high energy density	
saturation moment of Fe-Ni alloys ARG-90259 B68-101	72 03	M-FS-14661 B68-10218	01
Improved atomic resonance gas cell for use		AVALANCHE DIODES Current-limiting voltage regulator	
in frequency standards MSC-11666 B68-102	30 01	MSC-11824 B68-10305	01
ATOMIZERS		Solid state high-voltage pulser operates with low supply voltage	•
Miniature paint-spray gun for recessed areas		M-FS-14034 B68-10308	01
MSC-13060 B68-103	87 05	Transistorized Marx bank pulse circuit provides voltage multiplication with	
ATOMIZING Two-fluid, impinging-sheet injector NPO-10547 B68-103	38 05	nanosecond rise-time ARG-10110 B68-10328	01
	00 <b>0</b> 0	Low-cost, fast-response drive circuit for	
Miniature paint-spray gun for recessed areas		electromagnetic torque motors LEWIS-10143 B68-10386	01
MSC-13060 B68-103	87 05	Method for measuring alternator voltage	
ATTACHMENT Quick-attach clamp		transients LEWIS-10373 B68-10513	01
XFR-05421 B68-102	50. 05	AVERAGE	
ATTENUATION Shock and vibration response of multistage		Digital filter suppresses effects of nonstatistical noise bursts on multichannel	
structure	E9 0F	scaler digital averaging systems	
M-FS-14972 B68-103	53 05	ARG-90143 B68-10193	06

AXIAL FLOW  Dynamics of moving bubbles in single binary component systems	e and		Design of dissipative linear phase f M-FS-14698		01
M-FS-14845 AXIAL STRESS	B68-10339	02	BANDWIDTH Astronaut space suit communication a MSC-12101		01
Development of biaxial test fixture includes cryogenic application M-FS-14185	B68-10070	 01	Improved traveling wave maser amplif	ier	01
AXISYMMETRIC FLOW Axisymmetric two-phase perfect gas			Technique developed for measuring transmittance of optical birefring	ent	
performance program MSC-11774	B68-10374	06	networks M-FS-14267	B68-10260	20
AZIMUTH Improved electromechanical master-s manipulator	lave		Deep space FM system, a concept MSC-11825	B68-10289	01
ARG-10027	B68-10372	05	BARIUM TITANATES High-voltage pulse generator develop	ed for	
BACTERIA			wide-gap spark chambers ARG-10136	B68-10283	01
Vacuum probe sampler removes micron	-sized		High dielectric thick films for scre	ened	
particles from surfaces SAN-10003	B68-10231	04	circuit capacitors LANGLEY-10294	B68-10542	01
Electrolytic silver ion cell steril water supply	izes		BARS Modified sine bar device measures sm	nall	
MSC-11827	B68-10555	01	angles with high accuracy		02
BACTERIOLOGY Radiation effects on bacterial cell	.9		BASALT		
ARG-10064 BAFFLES	B68-10169	04	Preparing rock powder specimens of controlled size distribution NPO-10007	B68-10297	05
Flexible ring baffles for damping l	iquid		Thermal conductivity and dielectric		•
LANGLEY-90194	B68-10064	05	of silicate materials		03
Antiglare improvement for optical i systems	maging		BEAMS (SUPPORTS)		
NPO-10337	B68-10090	02	Fatigue of reinforced concrete beams dynamic loading	under	
BALANCING Laser system used for dynamic balan	cing of		M-FS-14980	B68-10515	05
gyros M-FS-12218	B68-10225	05	BEARINGS High-temperature bearing-cage materi LEWIS-10403		05
BALL BEARINGS Vacuum-jacketed transfer line insta	llation		Between-bearing shaft seal, a concep		
technique M-FS-14496	B68-10125	05			05
High-temperature bearing lubricants			Low cost techniques for fabricating bearings		
LEWIS-10408	B68-10249	05		B68-10441	05
Dynamic-reservoir lubricating devic M-FS-14652 High-speed pulse camera	B68-10261	05	BEDS (PROCESS ENGINEERING) Characteristics of fluidized-packed ARG-10049		03
MSC-11353	B68-10329	02	BELLOWS  Predicting fatigue life of metal bel	love	
BALLAST (MASS) Ballast barge concept for underwate					05
structures KSC-10196	B68-10168	05	Viscous damper MSC-12072	B68-10110	05
BALLS Flare angles measured with ball gag	ie.		Effect of surface irregularities on fatigue life	bellows	
M-FS-14690	B68-10030	01	M-FS-14480	B68-10229	05
BANDPASS FILTERS Improved relay optical element for spectroradiometer using cryogenic	ally		Conceptual hermetically sealed elbow actuator M-FS-14710		05
cooled detector MSC-11688	B68-10245	02	BENDING		
Thermal protective visor for enteri high temperature areas	ing		Astronaut space suit communication a MSC-12101		01
MSČ-10285	B68-10277	05	Conceptual hermetically sealed elbow actuator	1	
Deep space FM system, a concept MSC-11825	B68-10289	01	M-FS-14710	B68-10300	05
Method of reducing time base error	in		Design of fluid-duct bends with low pressure loss		
digital magnetic recorders GSFC-10108	B68-10317	01	M-FS-20176	B68-10395	05
			Improved technique for digital simul	lation	

of bending and slosh phenomena M-FS-14788	B68-10570	02	High-speed pulse camera MSC-11353	B68-10329	02
BENDING FATIGUE  Effect of surface irregularities on	bellows		Simultaneous message framing and err detection MSC-12001	or B68-10330	01
fatigue life M-FS-14480	B68-10229	05	H3C-12001	000-1000	01
BERYLLIUM Multilayer plated wire shows promis memory device	e as		BINARY FLUIDS Fluidic-thermochromic display device ERC-10031	B68-10350	01
MSC-11587	B68-10205	01	BINARY MIXTURES  Dynamics of moving bubbles in single	and	
Portable, high intensity isotopic n source provides increased experim accuracy			binary component systems M-FS-14845	B68-10339	02
ARG-90250	B68-10243	02	One-dimensional reacting gas nonequi performance program	librium	
Detection sensitivities in 3-8 MeV			MSC-11777	B68-10375	06
neutron activation ARG-10210	B68-10298	02	One-dimensional two-phase reacting g nonequilibrium performance program		
High-speed pulse camera	BCO 10500	00	MSC-11780	B68-10376	06
MSC-11353	B68-10329	02	BINARY SYSTEMS (MATERIALS)		
One-dimensional two-phase reacting nonequilibrium performance progra	m		Axisymmetric reacting gas nonequilib performance program		
MSC-11780	B68-10376	06	MSC-11781	B68-10377	06
High-emittance coatings on metal su LEWIS-10325 Temperature controlled strain gaged	B68-10381	03	BINDERS (MATERIALS) Application of the solid lubricant molybdenum disulfide by sputtering LEWIS-10544	j B68-10340	03
extensometer LEWIS-10353	B68-10543	01	BIOCHEMISTRY	200 10040	••
	£1_±		Study of radiation effects on mammal in vitro	lian cells	
Contact-spring forming machine for conductor cable receptacles	liat		ARG-10191	B68-10294	02
M-FS-20126	B68-10550	05	BIOINSTRUMENTATION		
BIBLIOGRAPHIES			Nosepiece respiration monitor		
Properties of optics at high temper their measurement, a study	ature and		ERC-10136	B68-10438	01
M-FS-14696	B68-10240	02	Pressure-sensitive bonded junction transducers		
Chemistry laboratory safety manual available			ERC-10087	B68-10563	01
SAN-10030	B68-10419	03	BIOTELEMETRY		
BILLETS			Multichannel implantable telemetry s ARC-10083	system B68-10065	01
Fabrication techniques developed for diameter, thin-wall tungsten and			Automated patient monitoring system		
alloy tubing ARG-10100	B68-10284	05	M-FS-14552	B68-10131	01
Training manuals for nondestructive	toatina		BIRDS Compound equation developed for post	tnatal	
using magnetic particles M-FS-20187	B68-10391	03	growth of birds and mammals ARG-10192	B68-10427	04
	000-10391	US		B00-10427	04
BIMETALS Bimetal sensor averages temperature nonuniform profile	of		BIREFRINGENCE Technique developed for measuring transmittance of optical birefring	gont.	
LEWIS-10362	B68-10007	01	networks	B68-10260	02
Tensile testing grips ensure unifor	m loading		M-FS-14267		
of bimetal tubing specimens LEWIS-10267	B68-10248	05	Synthesis of electro-optic modulator amplitude modulation of light M-FS-14268	rs for B68-10275	<i>.</i> ≱ 02
Lithium-tellurium bimetallic cell h	nas			230 20210	•
increased voltage ARG-10141	B68-10400	01	Correction for losses in optical birefringent networks, a concept M-FS-20088	B68-10571	02
New bimetallic EMF cell shows promi direct energy conversion	ise in		BISMUTH ALLOYS		
ARG-10183 BINARY ALLOYS	B68-10415	01	New bimetallic EMF cell shows promi: direct energy conversion ARG-10183	se in B68-10415	01
Ignition of binary alloys of uranic	ım			230 10410	01
ARG-10057	B68-10280	01	BISTABLE CIRCUITS Random access-random release relay		
BINARY DATA Simplified, high-speed binary data			switching matrix M-FS-12590	B68-10301	01
decoder NPO-10118	B68-10058	01	BIT SYNCHRONIZATION		
Digital filter cumpuscess officets	of.		Simultaneous message framing and er detection	ror	
Digital filter suppresses effects on monstatistical noise bursts on mo			MSC-12001	B68-10330	01
scaler digital averaging systems ARG-90143	B68-10193	06			
UKO AATAO	200 10130	00			

BITS Simultaneous message framing and error detection		M-FS-14806 B68-1 One-dimensional two-phase reacting gas	10360 03
MSC-12001 B68-10330	01	nne-unlensional two-phase reacting gas nonequilibrium performance program MSC-11780 B68-1	10376 06
BLADES Astronaut space suit communication antenna MSC-12101 B68-10238	01	Nickel-base superalloy*s excellent properties promote its service to 2200	
BLADES (CUTTERS) Acoustic wave analysis		degrees F LEWIS-10355 B68-1	10380 03
M-FS-18076 B68-10265 BLAST DEFLECTORS	02	Grain growth inhibitor for porous tungste materials LEWIS-10535 B68-1	
Blast deflector traps smoke and debris from explosive trains		LEWIS-10535 B68-1 BORON NITRIDES	10327 03
MSC-11241 B68-10105 BLOOD CIRCULATION	03	Grain growth inhibitor for porous tungste materials LEWIS-10535 B68-1	
New electrical plethysmograph monitors cardiac output		BOROSILICATE GLASS	
MSC-11447 B68-10220	01	Indium adhesion provides quantitative measure of surface cleanliness	
BOILING  Cryogenic liquid level measuring probe		SAN~10024 B68-1	10342 01
ARG-10138 B68-10291	01	BOTTLES  Compact monitoring and control console for pressurized gas bottles	or
Dynamics of moving bubbles in single and binary component systems M-PS-14845 B68-10339	02		10401 05
	02	BOUNDARY LAYER CONTROL	
Heat transfer coefficients for liquid hydrogen turbopumps		Dynamics of moving bubbles in single and binary component systems	
M-FS-18345 B68-10517	02		10339 02
BOLOMETERS Precision bolometer bridge		BOUNDARY LAYERS  Vacuum probe sampler removes micron-sized	i
MSC-11473 B68-10156 BOLTS	01	particles from surfaces SAN-10003 B68-1	10231 04
Tensile testing grips ensure uniform loading of bimetal tubing specimens		Acoustic wave analysis M-FS-18076 B68-J	10265 02
LEWIS-10267 B68-10248	05	BOUNDARY VALUE PROBLEMS	
Machining technique prevents undercutting in tensile specimens LANGLEY-10281 B68-10352	05	Controllability of distributed-parameter systems M-FS-14929 B68-1	10346 02
	03		10040 02
Boydbolt, a positive-latch, simple-release fastener MSC-13061 B68-10512	05	BRAZING Tube dimpling tool assures accurate dip-brazed joints	
BONDING		MSC-533 B68-1	10036 05
Method of disjoining adhesively bonded electronic cordwood modules MSC-12060 B68-10086	01	Evaluation of methods for nondestructive testing of brazed joints ARG-90175 B68-J	10191 03
Glass coated single grid for charged particle acceleration		Two-fluid, impinging-sheet injector NPO-10547 B68-1	10338 - 05
LEWIS-10106 B68-10215	03	X-ray film holder permits single	
Miniature pressure transducer for stressed member application		continuous picture of tubing joint	10343 05
MSC-11869 B68-10246	01	Nondestructive testing of brazed rocket	
Application of the solid lubricant molybdenum disulfide by sputtering LEWIS-10544 B68-10340	03	engine components M-FS-18191 B68-	10394 03
BONES		BREADBOARD MODELS Development of Electronic Data Processing	a
Instrumentation for bone density measurement MSC-11388 B68-10140	01	/EDP/ augmented management system	9 10287 06
BOOMS (EQUIPMENT)	_	BREATHING APPARATUS	
Hoisting frame facilitates handling of large objects M-FS-16166 B68-10575	05	Automatic patient respiration failure detection system with wireless transmi	ssion 10365 01
BORING MACHINES  Vertical boring mill capacity is increased		BRIDGES Temperature or pressure controller	
M-FS-16196 B68-10530	05		10337 01
BORON Analytical techniques for determining boron in graphite		BRIDGMAN METHOD  Electro-optic modulator for infrared lase using gallium arsenide crystal	er
ARG-10087 B68-10102	03	GSFC-10686 B68-	10255 02
Fiberglass-reinforced structural materials for aerospace application		BRIGHTNESS Rapid-response, light-exposure control	

BRITTLENESS SUBJECT INDEX

system NPO-10238	B68-10502	01	Technique developed for measuring transmittance of optical birefring	gen <b>t</b>	
DD TOOL DVDGG			networks	B68-10260	02
BRITTLENESS Fabrication techniques developed for diameter, thin-wall tungsten and t			M-FS-14267		02
alloy tubing ARG-10100	B68-10284	05	High-emittance coatings on metal sub LEWIS-10325	strates B68-10381	03
Preparing rock powder specimens of			CALCIUM OXIDES		
controlled size distribution			Isotopically pure magnesium isotope-	-24 is	
NPO-10007	B68-10297	05	prepared from magnesium-24 oxide		
BROADBAND			ARG-10154	B68-10293	20
Solid state high-voltage pulser oper	ates		CALCULATORS		
with low supply voltage			Fast method for obtaining scale dime		
M-FS-14034	B68-10308	01	on tape-controlled milling machine MSC-11609	B68-10047	05
BUBBLE CHAMBERS			N3C-11009	DOG 10047	00
Cryogenic liquid level measuring pro			CALCULUS OF VARIATIONS		
ARG-10138	B68-10291	01	HICOV /Newton-Raphson calculus of variation with automatic transver:	salities/	
BUBBLES			M-FS-14468	B68-10232	06
Reducing bubbles in glass coatings	improves				
electrical breakdown strength LEWIS-10278	B68-10214	03	CALIBRATING High-pressure gas facilitates calib	ration of	
LEWI3-10276	10214	00	turbine flowmeters for liquid hydr	rogen	
Dynamics of moving bubbles in single	e and		LEWIS-10402	B68-10145	01
binary component systems M-FS-14845	B68-10339	02	Absolute low-pressure calibration s	ustem	
10 11010	200 2000		M-FS-13085	B68-10160	20
Determining gas leakage from bubble			Liquid crystal calibrator		
formations M-FS-14841	B68-10393	05	M-FS-14151	B68-10221	03
BUCKLING Static structural analysis of shell-	-tune		Harmonic distortion analyzer speeds magnetic tape recorders	setup of	
structures	tape		GSFC-10198	B68-10254	01
MSC-11555	B68-10066	03	Conceptual dead weight device to pro	ani da	
Computer program analyzes Buckling (	of.		pressure calibration	ovide	
Shells Of Revolution with various			M-FS-14672	B68-10264	01
construction, BOSOR LANGLEY-10290	B68-10226	06	Computer graphics data conditioning		
LANGLE1-10250	000 10220	••	M-FS-14695	B68-10296	06
BUFFER STORAGE			Modified sine bar device measures s	11	
Simultaneous message framing and erm detection	ror		angles with high accuracy	Hall	
MSC-12001	B68-10330	01	GSFC-438	B68-10322	20
BUILDINGS			Experiments with ceramic coatings		
Computer program conducts facilities	3		M-FS-18150	B68-10355	03
utilization and occupancy survey NPO-10438	B68-10137	06	Detection of effect of deposits on	ontical	
NPD-10436	D00-10137	00	windows of pyrometer measurements	optical	
BUOYANCY			LEWIS-10366	B68-10367	01
Pneumatic raft automatically reforms rupture of buoyant member	s after		System measures response time of		
MSC-11562	B68-10011	05	photomultiplier tubes		
DUGATIONS			LEWIS-10437	B68-10382	01
BUTADIENE Dispensing graduate for butadiene			Automatic calibration system for pro	essure	
NP.O-10070	B68-10524	03	transducers		۸,
			M-FS-20127	B68-10412	01
C			Automatic calibration apparatus for		
CABLES (ROPES)			telemetry systems NPO-10560	B68-10514	01
Quick-attach clamp XFR-05421	B68-10250	05	WAD-10200	D00-10314	01
			Dispensing graduate for butadiene		
Pyrotechnic-actuated cable release XNP-10849	B68-10535	05	NPO-10070	B68-10524	03
ANI 10045	200 10000	•	CALORIMETERS		
CADMIUM SELENIDES	n.n1		Twin solution calorimeter determine heats of formation of alloys at h		
Improved radiographic image amplific M-FS-14522	er panei B68-10363	02	temperatures	ıgn	
			ARG-10114	B68-10083	01
CADMIUM SULFIDES Improved radiographic image amplific	er nanel		Electronic calorimetric computer		
M-FS-14522	B68-10363	02	LEWIS-90254	B68-10138	01
Floatuan harm manustallingting of	amannha		Steady-state differential calorimet	e P	
Electron beam recrystallization of semiconductor materials	amorhuona		measures gamma heating in reactor		
LEWIS-10443	B68-10556	02	ARG-10120	B68-10182	01
CALCITE			CAMBERED WINGS		
Electro-optic modulator for infrare	d laser		Modified Multhopp mean camber compu	ter	
using gallium arsenide crystal GSFC-10686	B68-10255	02	program LANGLEY-10376	B68-10446	06

CAMERA SHUTTERS Fluorescent particles enable visua of gas flow			One-dimensional two-phase reacting gand nonequilibrium performance program MSC-11780	as B68-10376	06
. M-FS-14583	B68-10259	02	Axisymmetric reacting gas nonequilib	rium	
High-speed pulse camera MSC-11353	B68-10329	0,2	performance program MSC-11781	868-10377	06
CAMERA TUBES  New camera tube improves ultrasoni inspection system	c		Nickel-base superalloy*s excellent properties promote its service to a degrees F	2200	
ARG-90237	B68-10088	01		B68-10380	03
Technique increases storage capaci	ty in		CARBON DIOXIDE		
camera tube target MSC-11599	B68-10213	01	Plume radiation program M-FS-13202	B68-10447	06
CAMERAS			Repetitively pulsed, wavelength-selec	:tive	
Rocket engine nozzle photographic system			carbon dioxide laser ERC-10178	B68-10564	02
NPO-10174	B68-10113	02	CARRIAGES		
CANCER Compound equation developed for po	stnatal		Swing arm carrier protects flexible : during test item rotation	lines	
growth of birds and mammals ARG-10192	B68-10427	04		B68-10037	05
	868-10427	04	CARRIER WAVES		
CANONICAL FORMS  Design techniques - Stochastic con MSC-11554	trollers B68-10234	02	Dynamic linearity measurement technic KSC-10186	que 868-10290	01
CANTILEVER MEMBERS			CARTRIDGES		
Conceptual dead weight device to p pressure calibration	rovide		Versatile impact hand tool. M-FS-20140	B68-10371	05
M-FS-14672	B68-10264	01	CASSEGRAIN ANTENNAS Computer program aids dual reflector	antenna	
CAPACITANCE Capacitance-coupled wiper increase	e e		system design	B68-10139	06
potentiometer life		0.1			•
ARC-10060	B68-10175	01	Computer program for machine design of Cassegrain feed systems	)1	•
High-voltage pulse generator devel wide-gap spark chambers	oped for		NPO-10588	B68-10421	06
ARG-10136	B68-10283	01	CASTINGS Compressible sleeve provides automat	íc	
CAPACITORS	aunda d		centering for grinding or turning		
Gyrator-type circuits replace ungr inductors			cylinders SAN-10021	B68-10318	05
XAC-10608	B68-10084	01	CATABOLISM		
Improved process for making thin-f niobate capacitors	ilm sodium		Study of behavior of sterols at inte ARG-10085	rfaces B68-10281	03
MSC-11231	B68-10163	01	CATALYSTS		
Miniature pressure transducer for	stressed		Improved fuel-cell-type hydrogen sen		
member application MSC-11869	B68-10246	01		B68-10263	01
Transistorized Marx bank pulse cir	cuit		Ambient temperature catalyst for hyding ignition	rogen	
provides voltage multiplication nanosecond rise-time	with		LEWIS-10551	B68-10520	03
ARG-10110	B68-10328	01	CATALYTIC ACTIVITY		
Automatic patient respiration fail			Method of maintaining activity of hydrogen-sensing platinum electrode		
detection system with wireless t ARC-10174	B68-10365	01	M-FS-1422	B68-10049	03
High dielectric thick films for sc	reened	•	CATHODE RAY TUBES  Luminescent screen composition for		
circuit capacitors LANGLEY-10294	B68-10542	01	cathode ray tubes	B68-10056	01
CARBIDES			•		-
High temperature alloy			System measures arc energy dissipate relay contact cycling		
LEWIS-10377	B68-10253	03	M-FS-14541	B68-10312	01
Nickel-base superalloy*s excellent properties promote its service t degrees F			System for measuring spatial distrib ejected droplets, a concept NPO-10185	ution of B68-10402	01
LEWIS-10355	B68-10380	03		200 IV402	71
CARBON			CATHODES Improved fuel-cell-type hydrogen sen		
Fiberglass-reinforced structural m for aerospace application	aterials		M-FS-14656	B68-10263	01
M-FS-14806	B68-10360	03	Solid state high-voltage pulser oper with low supply voltage	ates	
One-dimensional reacting gas noneq	uilibrium			B68-10308	01
performance program MSC-11777	B68-10375	06	Inverted grounding technique for ele	ctron	

LEWIS-10543	B68-10411	01	Indium adhesion provides quantitative measure of surface cleanliness	
CAVITIES			SAN-10024 B68-10342	01
Shock-absorbing caster wheel is si compact SAN-10019	B68-10266	05	Grain-boundary migration in KCl bicrystals ARG-10181 B68-10455	03
DAR 10015	DOD 10200	00	NG 10101 B00 10400	•
CAVITY RESONATORS  Improved atomic resonance gas cell	for use		CERIUM COMPOUNDS  Ceric and ferrous dosimeters show precision	
in frequency standards	DG0 10050		for 50-5000 rad range	00
MSC-11666	B68-10230	01	ARG-10173 B68-10426	02
CDC COMPUTERS			CESIUM	
Fully automatic telemetry data pro GSFC-10576	B68-10336	01	Improved atomic resonance gas cell for use in frequency standards	
			MSC-11666 B68-10230	01
Modified Multhopp mean camber comp program	outer		CESIUM VAPOR	
LANGLEY-10376	B68-10446	06	Distillation device supplies cesium vapor at	
CDC 6600 COMPUTER			constant pressure XNP-08124 B68-10020	03
Computer program TRACK performs tr				
and/or steady state thermal anal coupled fluid flow and heat cond			CHAINS Suspended chains damp wind-induced	
NUC-10189	B68-10450	06	oscillations of tall flexible structures	
CELLOPHANE			LANGLEY-10193 B68-10042	05
Separator for alkaline batteries			CHARGE TRANSFER	
GSFC-10173	B68-10557	03	Fundamental electrode kinetics ARG-10067 B68-10196	03
CELLS				••
Low energy chmmeter can be used to sensitive circuits, other meters			CHARGING  Electrochemical cell has internal resistive	
SAN-10013	B68-10269	01	heater element	
Optimetric system facilitates colo	rimetric		GSFC-10358 B68-10325	01
and fluorometric measurements			CHARRING	
NPO-10233	B68-10316	01	Fire retardant foams developed to suppress fuel fires	
CELLS (BIOLOGY)			ARC-10098 B68-10358	03
Radiation effects on bacterial cel ARG-10064	11s B68-10169	04	CHARTS	
		• •	Charts designate probable future	
Study of radiation effects on mamming in vitro	nalian cells		oceanographic research fields M-FS-20202 B68-10397	01
ARG-10191	B68-10294	02		<b>.</b>
Stratification of centrifuged amoe	sha nuclei		CHEMICAL CLEANING  Effects of surface preparation on quality	
investigated by electron microso	ору		of aluminum alloy weldments	
ARG-10161	B68-10366	04	M-FS-13152 B68-10302	03
A microlagoon technique for the cu	ılture of		CHEMICAL COMPOSITION	
mammalian cells LANGLEY-10407	B68-10554	04	Elementary review of electron microprobe techniques and correction requirements	
			ARG-10062 B68-10195	03
CELLULOSE Separator for alkaline batteries			One-dimensional reacting gas nonequilibrium	
GSFC-10173	B68-10557	03	performance program	
CENTRIFUGAL FORCE			MSC-11777 B68-10375	06
Dynamic-reservoir lubricating devi			One-dimensional two-phase reacting gas	
M-FS-14652	868-10261	05	nonequilibrium performance program MSC-11780 B68-10376	06
Design of fluid-duct bends with lo	<b>.</b> ₩			
pressure loss M-FS-20176	B68-10395	05	Axisymmetric reacting gas nonequilibrium performance program	/8-
			MSC-11781 B68-10377	06 <sup>- (*</sup>
CENTRIFUGAL PUMPS Acoustic wave analysis			CHEMICAL COMPOUNDS	
M-FS-18076	B68-10265	20	Product identification techniques used as	
CENTRIFUGING			training aids for analytical chemists SAN-10025 B68-10373	03
Stratification of centrifuged amon			CHEMICAL ELEMENTS	
investigated by electron microso	B68-10366	04	Ignition of binary alloys of uranium	
			ARG-10057 B68-10280	01
CERAMIC COATINGS  Experiments with ceramic coatings			Detection sensitivities in 3-8 MeV	
M-FS-18150	B68-10355	03	neutron activation	0.2
CERAMICS			ARG-10210 B68-10298	02
Reinforced thermal-shock resistant		0.7	CHEMICAL PROPERTIES  High strength nickel-base alloy with	
LEWIS-10376	B68-10085	03	improved oxidation resistance up to 2200	
Manganese-alumina-ceramic glass el rigid controls necessary in bond			degrees F LEWIS-10115 B68-10094	03
to ceramics	-			00
SAN-10012	B68-10204	03	CHEMISTRY Chemistry laboratory safety manual	
			overizera recordedia agreed mountai	

	available	B68-10419	03	LEWIS-10373	B68-10513	01
	SAN-10030	D00-10419	03	CIRCUIT RELIABILITY		
•	CHLORIDES Saran film is fire-retardant in oxy	ugen		Improved compensation circuit for direct-coupled amplifiers		
	atmosphere			MSC-11148	B68-10133	01
	MSC-11604	B68-10177	03	Low energy ohmmeter can be used to	tost	
	CHLORINE			sensitive circuits, other meters		
	One-dimensional reacting gas noneque performance program	uilibrium		SAN-10013	B68-10269	01
	MSC-11777	B68-10375	06	Solid state high-voltage pulser ope	rates	
	One-dimensional two-phase reacting	gas		with low supply voltage M-FS-14034	B68-10308	01
	nonequilibrium performance progra	am				
	MSC-11780	B68-10376	06	Analysis and design of a class-D an M-FS-14803	npiiiier B68-10313	01
	Axisymmetric reacting gas nonequil	ibrium		m		
	performance program MSC-11781	B68-10377	06	Transistorized Marx bank pulse circ provides voltage multiplication w		
	all apopular i a			nanosecond rise-time	B68-10328	01
	CHLOROPHYLLS  The preparation, identification and	đ		ARG-10110	800-10320	01
	properties of chlorophyll deriva	tives	0.7	Closed circuit TV system automatica	ally	
	ARG-10205	B68-10409	03	guides welding arc M-FS-20084	B68-10357	01
	CHOKES (RESTRICTIONS)			at Daut ma		
	Improved limiter for turn-on current transient	nt .		CIRCUITS One-shot pulse shaper circuit		
	GSFC-10413	B68-10384	01	XGS-11379	B68-10012	01
	CHROMATOGRAPHY			Synchronized circuit improves accur	racy of	
	Study of behavior of sterols at in ARG-10085		0.7	fluid transfer measurements	B69_10057	05
	. Wrd-10082	B68-10281	03	MSC-11167	B68-10057	05
	The preparation, identification and			Gyrator-type circuits replace ungro	ounded	
	properties of chlorophyll deriva ARG-10205	B68-10409	03	inductors XAC-10608	B68-10084	01
	CHROMIUM			Circuit enhances vertical resolution	on in	
	Nickel-base superalloy*s excellent			raster scanning systems		
	properties promote its service to degrees F	o 2200		MSC-12123	B68-10121	01
	LEWIS-10355	B68-10380	03	Compensation circuit improves opera	ation of	
	CHROMIUM ALLOYS			inductive coupling transformers M-FS-13801	B68-10129	01
	Application of the solid lubricant			T		
	molybdenum disulfide by sputteri LEWIS-10544	ng B68-10340	03	Improved compensation circuit for direct-coupled amplifiers		
	Tunnahan filma asinfanasi minkal a			MSC-11148	B68-10133	01
	Tungsten fiber-reinforced nickel s LEWIS-10424	B68-10369	03	Tunnel diode circuit used as		
	CHROMOSOMES			nanosecond-range time marker ARG-90164	B68-10173	01
	Study of radiation effects on mamm	alian cells			500 101.0	٠.
	in vitro ARG-10191	B68-10294	02	Welder analyzer MSC-12068	B68-10242	01
		200 2020 1	V-2			
	CIRCUIT BOARDS Inspection criteria ensure quality	control		Silicon strain sensors enable press measurement at cryogenic tempera		
	of parallel gap soldering			M-FS-14703	B68-10262	01
	M-FS-14530	B68-10257	05	Improved fuel-cell-type hydrogen s	ensor	
	Random access-random release relay	•		M-FS-14656	B68-10263	01
	switching matrix M-FS-12590	B68-10301	01	Low energy ohmmeter can be used to	test	
		_4_4		sensitive circuits, other meters	B68-10269	01
	Standards for compatibility of pri circuit and component lead mater			5AN-10013	B00-10209	01
	M-FS-14531	B68-10310	01	System measures arc energy dissipa relay contact cycling	ted in	
	CIRCUIT BREAKERS			M-FS-14541	B68-10312	01
	Current-limiting voltage regulator MSC-11824	B68-10305	01	Method of reducing time base error	in	
		200 2000	,	digital magnetic recorders		
	CIRCUIT PROTECTION  Low energy ohmmeter can be used to	test	·	GSFC-10108	B68-10317	01
	sensitive circuits, other meters			Low-cost, fast-response drive circ	uit for	
	SAN-10013	B68-10269	01	electromagnetic torque motors LEWIS-10143	B68-10386	01
	Current-limiting voltage regulator		0.1	•		
	MSC-11824	B68-10305	01	Two-way digital driver/receiver use set of lines		
	Short circuit protection for a pow	er		ERC-10055	B68-10437	01
	distribution system M-FS-14993	B68-10443	01	Performance analysis of electrical	circuits	
	Method for measuring alternator vo	ltage		/PANE/ M-FS-15001	B68-10448	06
	transients	Lage		1. 10 10001	200 10440	50

•					
Readout system for radiation detect MSC-90180	or B68-10501	01	High-emittance coatings on metal sub LEWIS-10325	bstrates B68-10381	03
Locating **sneak paths** in electri circuitry M-FS-15018	B68-10565	01	Method for making small pointed thermocouples SAN-10014	B68-10389	01
Welding skate with computerized con M-FS-20224	trols B68-10566	01	COAXIAL CABLES  Cryogenic liquid level measuring pro ARC-10138	obe B68-10291	01
CIRCULAR ORBITS  Generalized Newton-Raphson trajecto optimization-generator 1			Coaxial cable stripper for confined KSC-10167		05
M-FS-15020 CIRCULAR PLATES	B68-10422	06	COBALT Nickel-base superalloy*s excellent		
Computer program performs frequency analysis of nonuniform turbine di subjected to temperature gradient	sk		properties promote its service to degrees F LEWIS-10355	2200 B68-10380	03
NUC-10301	B68-10006	06	COBALT ALLOYS		
CLADDING  Consolidation and fabrication techn for vanadium-20 w/o titanium /TV-			Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378	B68-10095	03
ARG-10148 CLAMPS	B68-10368	03	High temperature alloy LEWIS-10377	DC0_102E3	03
Clamp for detonating fuze M-FS-13399	B68-10072	05	Inspection criteria ensure quality of	B68-10253	US
Improved traveling wave maser ampli		01	of parallel gap soldering M-FS-14530	B68-10257	05
Quick-attach clamp	Б00-10244	. 01	COBOL DOWN down to the land who was been duted a		
XFR-05421	B68-10250	05	DSN seven day/twelve week schedule p NPO-10752	B68-10410	06
CLEAN ROOMS Locating and sealing air leaks in			COCKS Versatile impact hand tool		
multiroomed buildings NUC-10304	B68-10024	05	M-FS-20140	B68-10371	05
Vacuum probe sampler removes micron particles from surfaces SAN-10003	-sized B68-10231	04	CODERS Accumulator for shaft encoder M-FS-13599	B68-10093	01
Biological isolation garment MSC-12206			Color-televised medical microscopy MSC-13086	B68-10314	01
CLEANING	B68-10500	04	High-speed pulse camera MSC-11353	B68-10329	02
Vacuum probe sampler removes micron particles from surfaces	-sized		Simultaneous message framing and err		
SAN-10003	B68-10231	04	detection MSC-12001	B68-10330	01
Miniature paint-spray gun for reces areas	sed		COEFFICIENTS		
MSC-13060	B68-10387	05	Linear systems of equations solved a mathematical algorithms	-	
Conditioning flat conductors for fl conductor cable production M-FS-14914	at B68-10429	01	ARG-10146 COHERENT LIGHT	B68-10292	06
CLEANLINESS	866-10429	01	Improvement in recording and reading holograms	g	
Indium adhesion provides quantitati measure of surface cleanliness			ERC-10151	B68-10347	02
SAN-10024  CLOSED CIRCUIT TELEVISION	B68-10342	01	Repetitively pulsed, wavelength-seld carbon dioxide laser ERC-10178	B68-10564	02
Closed circuit TV system automatica guides welding arc	-		COILS		
M-FS-20084 COATING	B68-10357	01	Quick-attach clamp XFR-05421	B68-10250	05
Improved relay optical element for spectroradiometer using cryogenic cooled detector	ally		COLD TRAPS  Electronic circuit provides automaticontrol for liquid nitrogen traps	ic level	
MSC-11688	B68-10245	02	KSC-10127	B68-10061	01
Food products for space application MSC-11697	B68-10324	04	COLLAPSE  Dynamics of moving bubbles in single binary component systems		
Detection of effect of deposits on windows of pyrometer measurements		0.1	M-FS-14845	B68-10339	02
LEWIS-10366  COATINGS  Application of the solid lubricant	D00-1030/	01 .	COLLIMATION Improvement in recording and reading holograms ERC-10151	B68-10347	02
molybdenum disulfide by sputterin LEWIS-10544	g B68-10340	03	COLLIMATORS Improved electro-optical tracking sy		- <del>-</del>

M-FS-14791	B68-10311	01	networks M-FS-14267	B68-10260	02
Modified sine bar device measures or angles with high accuracy			Synthesis of electro-optic modulate	rs for	
GSFC-438	B68-10322	02	amplitude modulation of light M-FS-14268	B68-10275	02
Training manual on optical alignme:		,	Acceleration insensitive fluid expa	nsion	
M-FS-20292	B68-10574	02	compensator ERC-10152	B68-10559	01
COLONIES Study of radiation effects on mamma	alian cells		COMPLEX VARIABLES		
in vitro ARG-10191	B68-10294	02	Digital filter synthesis computer p ARC-10130	B68-10164	06
COLOR			COMPONENT RELIABILITY		
Luminescent screen composition for cathode ray tubes ERC-19	DCC 1005C	0.1	New method for critical failure pre of complex systems	B68-10252	00
<del></del>	B68-10056	01	M-FS-14133		02
Fluidic-thermochromic display device ERC-10031	B68-10350	01	Low energy ohmmeter can be used to sensitive circuits, other meters SAN-10013	B68-10269	01
COLOR PHOTOGRAPHY Shortened procedure for obtaining			Electronic component reliability ar	nalvsis	
reproducible copies of 35 mm cold KSC-09957	or slides B68-10560	02	by data reduction system NPO-10243	B68-10507	05
COLOR TELEVISION			COMPOSITE MATERIALS		
Color-televised medical microscopy MSC-13086	B68-10314	01	Reinforced thermal-shock resistant LEWIS-10376	ceramics B68-10085	03
COLORIMETRY			Fiberglass-reinforced structural ma	iterials	
Optimetric system facilitates color and fluorometric measurements	rimetric		for aerospace application M-FS-14806	B68-10360	03
NPO-10233	B68-10316	01	Tungsten fiber-reinforced nickel su	merallov	
COLUMNS (SUPPORTS)  Deployable lattice column  NPO-10228	DCS 10000	0.5	LEWIS-10424	B68-10369	03
NPU-10228	B68-10082	05	COMPOSITE STRUCTURES  Evaluation of superconducting magne	ets, a	
COMBUSTION  Temperature or pressure controller			study M–FS–14808	B68-10396	02
LEWIS-10297	B68-10337	01			
Analysis of annular combustors LEWIS-10399	B68-10356	06	COMPRESSED AIR  Compact monitoring and control conspressurized gas bottles		
COMBUSTION CHAMBERS			M-FS-14874	B68-10401	05
Analysis of annular combustors LEWIS-10399	B68-10356	06	COMPRESSIBILITY Shock-absorbing caster wheel is sin compact	nple and	
COMMAND AND CONTROL	_		SAN-10019	B68-10266	05
Design concept for a rapid automat acquisition system	ic sync		COMPRESSIVE STRENGTH		
NPO-10214	B68-10428	01	Nondestructive method for measuring stresses in metals, a concept	g residual	
COMMUNICATION EQUIPMENT Astronaut space suit communication	antonna		KSC-10237	B68-10378	03
MSC-12101	B68-10238	01	COMPRESSORS		
Improved traveling wave maser ampl			Cooled miniature pressure transduce effective at high temperatures		
NPO-10548	B68-10244	01	LEWIS-10401	B68-10370	01
COMPARATORS Optical system facilitates inspect printed circuit boards	ion of		Combination probe for airflow measu LEWIS-10281	urements B68-10558	01
GSFC-07971	B68-10021	02	COMPUTATION  Computer program for interplanetar;	v conic	
Closed circuit TV system automatic	ally		patching M-FS-14296	-	0.0
guides welding arc M-FS-20084	B68-10357	01		B68-10033	06
COMPATIBILITY			COMPUTER DESIGN Two-way digital driver/receiver use	es one	
Consolidation and fabrication tech			set of lines		
for vanadium-20 w/o titanium /TV ARG-10148	-20/ B68-10368	03	ERC-10055	B68-10437	01
COMPENSATORS			COMPUTER PROGRAMMING MOP /Matrix Operation Programs		
Compensation circuit improves oper	ation of		system/	DC0 10005	0.0
inductive coupling transformers M-FS-13801	B68-10129	01	NPO-10429	B68-10005	06
Improved compensation circuit for direct-coupled amplifiers			Accumulator for shaft encoder M-FS-13599	B68-10093	01
MSC-11148	B68-10133	01	COMPUTER PROGRAMS		
Technique developed for measuring transmittance of optical birefri	ngent		Computer program performs frequency analysis of nonuniform turbine desubjected to temperature gradien	isk	

NUC-10301	B68-10006	06	FORTRAN optical lens design program	n B68-10354	06
Computer program calculates and plosurface area and pore size distr GSFC-10362		06	Analysis of annular combustors LEWIS-10399	B68-10356	06
Computer program for interplanetar; patching M-FS-14296	y conic	06	Real fluid properties of normal and parahydrogen LEWIS-10458	B68-10361	06
General computer program for calcu of radiation from inhomogeneous, nonisothermal rocket exhaust plu	nonisobaric, me		Axisymmetric two-phase perfect gas performance program MSC-11774	B68-10374	06
M-FS-14314  Fast method for obtaining scale di	B68-10044	06	One-dimensional reacting gas noneque performance program	ilibrium	
on tape-controlled milling maching MSC-11609		05	MSC-11777	B68-10375	06
Computer program performs stiffness structural analysis NPO-10502	s matrix B68-10096	06	One-dimensional two-phase reacting nonequilibrium performance progra MSC-11780		06
Computer program calculates veloci streamlines in turbomachines			Axisymmetric reacting gas nonequili performance program MSC-11781	B68-10377	06
LEWIS-10252	B68-10097	06	Internal velocity factors	DC0 10407	0.6
Computer program conducts facilitie utilization and occupancy survey NPO-10438		06	MSC-15002  Analysis of filament reinforced met pressure vessels	B68-10403	06
Computer program aids dual reflecte system design			LEWIS-10352	B68-10405	06
NPO-10501  Computer programs for thermodynamic	B68-10139	06	DSN seven day/twelve week schedule NPO-10752	program B68-10410	06
transport properties of hydrogen NUC-10537		06	CIRCUSA digital computer program transient analysis of electronic M-FS-15002		06
Computer program determines exact tolerance limits for normal dist M-FS-18045		06	Computer program for machine design Cassegrain feed systems		
Computer program determines vibrat: three-dimensional space of hydra excited by forced displacements	ulic lines		NPO-10588  Generalized Newton-Raphson trajecto optimization-generator 1	-	06
M-FS-12226  Digital filter synthesis computer	B68-10159	06	M-FS-15020  Symbolic reduction of block diagram	B68-10422	06
ARC-10130	B68-10164	06	FORMAC LEWIS-10409	B68-10423	06
ELAS - A general purpose computer profession for the equilibrium problems of structures			Conditioning flat conductors for fl conductor cable production	at	
NPO-10598	B68-10187	06	M-FS-14914	B68-10429	01
JPKWIC - General key word in contex subject index report generator NPO-10589	kt and B68-10208	06	GERT EXCLUSIVE-OR combining paths a loops of electrical networks ERC-10206	B68-10435	06
Computer program determines system stability /DIGSTA/ LEWIS-10395	B68-10216	06	Modified Multhopp mean camber compu program LANGLEY-10376	iter B68-10446	06
Computer program offers new method	for	•	Plume radiation program	DOC 10440	
constructing periodic orbits in a dynamical systems M-FS-14654	monlinear B68-10217	06	M-FS-13202 Single degree of freedom antenna po	B68-10447	06
Computer program analyzes Buckling	0 <b>f</b>	•	program /ANTENA/ NPO-10756	B68-10449	06
Shells Of Revolution with various construction, BOSOR LANGLEY-10290	8 wall B68-10226	06	Computer program TRACK performs tra and/or steady state thermal analy	sis with	
SEAL /Subnetwork Enumeration And Listing/ ERC-10116	B68-10227	06	coupled fluid flow and heat condu NUC-10189  A request-oriented information sele	B68-10450	06
HICOV /Newton-Raphson calculus of		30	program LEWIS-10255	B68-10451	06
variation with automatic transver M-FS-14468	B68-10232	06	Modified Multhopp lifting surface l	oading	
Computer graphics data conditioning M-FS-14695	B68-10296	06	LANGLEY-10375	B68-10452	06
Computer program analyzes and design supersonic wing-body combinations ARC-10141		06	Computer program for parameter optimization ARC-10168	B68-10453	06
	200 10000		GERT simulation program for GERT ne	twork	

analysis ERC-10209	B68-10457	06	CONDUCTING FLUIDS  Concept to convert electrical power  GSFC-10222	B68-10321	01
Welding skate with computerized con M-FS-20224	trols B68-10566	01	CONDUCTIVITY  Improved radiographic image amplifie		••
Digital computer technique for setu checkout of an analog computer	-	,	M-FS-14522	B68-10363	20
M-FS-13969 COMPUTER STORAGE DEVICES	B68-10576	06	CONDUCTORS  Inspection criteria ensure quality confidering	ontrol	
Multilayer plated wire shows promis memory device MSC-11587	se as B68-10205	01		B68-10257	05
Fully automatic telemetry data proc	essor		Tensile testing grips ensure uniform of bimetal tubing specimens	, , ,	
GSFC-10576	B68-10336	01		B68-10248	05
COMPUTERIZED DESIGN Computer program aids dual reflecto system design			CONICAL NOZZLES  Venturi meter with separable diffuser  LEWIS-10483	r B68~10295	05
NPO-10501	B68-10139	06	Axisymmetric two-phase perfect gas		
FORTRAN optical lens design program NPO-10603	B68-10354	96	performance program	B68-10374	06
Analysis of annular combustors LEWIS-10399	B68-10356	06	One-dimensional two-phase reacting g nonequilibrium performance program MSC-11780		06
COMPUTERIZED SIMULATION  Assembly, checkout, and operation optimization analysis technique f	or		CONNECTORS Remotely operated gripper provides vo	ertical	
complex systems M-FS-14105	B68-10222	05	control rod movement ARG-10160	B68-10359	05
GERT simulation program for GERT ne	twork		CONSOLES		
analysis ERC-10209	B68-10457	06	Compact monitoring and control conso pressurized gas bottles M-FS-14874	le for B68-10401	05
COMPUTERS Small, low power analog-to-digital			CONSTRICTIONS		•
converter M-FS-13954	B68-10016	01	Electrochemical cell has internal re heater element		
Circuit detects voltage decrease in	ı			B68-10325	01
computer power supply KSC-67-120	B68-10019	01	CONSTRUCTION  Improved atomic resonance gas cell for in frequency standards		
Electronic calorimetric computer LEWIS-90254	B68-10138	01	MSC-11666	B68-10230	01
Design techniques - Stochastic cont	rollers		CONSTRUCTION MATERIALS Fiberglass-reinforced structural mat	erials	
MSC-11554	B68-10234	02	for aerospace application	B68-10360	03
Fluidic-thermochromic display devic ERC-10031	e B68-10350	01	CONTAINERS		
Electronic component reliability an by data reduction system	nalysis		Graphite cloth facilitates vacuum evaporation of silicon monoxide M-FS-14764	B68-10256	03
NPO-10243	B68-10507	05			••
CONCENTRATION (COMPOSITION)  Dynamics of moving bubbles in single	le and		Contact-spring forming machine for f conductor cable receptacles M-FS-20126	B68-10550	05
binary component systems M-FS-14845	B68-10339	02	CONTAMINANTS		
CONCENTRICITY System for measuring roundness and			Indium adhesion provides quantitativ measure of surface cleanliness SAN-10024	e B68-10342	01
concentricity of large tanks M-FS-13362	B68-10099	05	CONTAMINATION  Monitor senses amount of contaminati	on	
CONCRETES  Ballast barge concept for underwate structures	∍r		deposited on surfaces	B68-10089	01
KSC-10196	B68-10168	05	Vacuum probe sampler removes micron-	sized	
Fatigue of reinforced concrete beam	ns under		particles from surfaces SAN-10003	B68-10231	04
dynamic loading M-FS-14980	B68-10515	05	Preparation of silver-activated zinc	sulfide	
CONDENSATES			thin films GSFC-10687	B68-10271	03
Axisymmetric two-phase perfect gas performance program			Effects of surface preparation on qu	ality	
MSC-11774 CONDENSING	B68-10374	06	of aluminum alloy weldments	B68-10302	03
Cooling of 2 kW H subscript 2-0 sub fuel cell	bscript 2		Contamination control handbook M-FS-20185	B68-10392	03
M-FS-13737	B68-10544	0.1	H 10 20100	200 10035	93

UV detector monitors organic contam of optical surfaces M-FS-20246	ination B68-10413	- 01	channel flow ARG-10102 B6	68-10181	02
CONTINUOUS RADIATION Shock and vibration response of mul		. 01	CONVECTIVE HEAT TRANSFER Thin film heat transfer gage is stable at higher temperatures	e	
structure M-FS-14972	B68-10353	05		68-10051	01
CONTOURS		00	Two-fluid, impinging-sheet injector NPO-10547 B6	68-10338	05
Automatic contour welder incorporate speed control system	es		CONVERSION		
M-FS-14574 CONTROL	B68-10091	01	Input gate circuit converted for use a linear amplifier		
Rapid-response, light-exposure cont	rol			68-10015	01
system NPO-10238	B68-10502	01	COOLANTS  Coolants with selective optical filter characteristics for ruby laser appli		
Fluid power-transmitting gas bearing ERC-10097	B68-10503	05	M-FS-20188 B6	68-10508	02
Digital laser-beam deflection sensor M-FS-14785	r B68-10525	01	Thermal short improves sensitivity of cryogenically cooled maser	68-10059	01
CONTROL BOARDS  Compact monitoring and control cons	ole for		Detection sensitivities in 3-8 MeV		
pressurized gas bottles M-FS-14874	B68-10401	05	neutron activation	68-10298	20
CONTROL EQUIPMENT Pressure variable orifice for hydrau control valve			Microprobe investigation of brittle segregates in aluminum MIG and TIG w M-FS-14720 B6		03
MSC-11323	B68-10120	05	Dynamics of moving bubbles in single a	and	
Improved active vibration isolator LANGLEY-10106	B68-10123	05	binary component systems M-FS-14845 B6	68-10339	02
Device provides controlled gas leak: NPO-10298	B68-10142	03	Evaluation of superconducting magnets, study M-FS-14808	-	02
Design techniques - Stochastic cont MSC-11554	rollers B68-10234	02	Battery-package design provides for ce cooling and constraint		02
Random access-random release relay switching matrix			MSC-11839 B6	68-10398	05
M-FS-12590  Current-limiting voltage regulator	B68-10301	01	Heat-load simulator for heat sink desi MSC-15170 Be		02
MSC-11824	B68-10305	01	High conductance vapor thermal switch GSFC-10109 B6	68-10519	02
Improved limiter for turn-on current transient	t .		Cooling of 2 kW H subscript 2-0 subscr	ript 2	
GSFC-10413	B68-10384	01	fuel cell	_	01
Automatic solar lamp intensity contr	rol			70-10044	
system XGS-10017	B68-10399	01	COOLING SYSTEMS Viscosity and density of methanol/wate mixtures at low temperatures	≥ <b>r</b>	
Charge control of nickel-cadmium ba- by coulometer and third electrode			M-FS-14991 B6	68-10274	03
GSFC-10487  Fluidic transducer gives pressure o	B68-10431	01	Cooled miniature pressure transducers effective at high temperatures	59_10370	01
function of temperature ERC-10093	B68-10537	05	Dual-purpose chamber-cooling system	68-10370	01
Fluidic analog amplifier ERC-10102	B68-10538	. 05	NPO-10467 B6	68-10506	02 ຶ
		05	COPPER Multilayer plated wire shows promise a	18	
Welding skate with computerized con- M-FS-20224	trols B68-10566	01	memory device MSC-11587 B6	58-10205	01
CONTROL RODS  Remotely operated gripper provides vicentrol rod movement	vertical		Astronaut space suit communication ant MSC-12101 B6		01
ARG-10160	B68-10359	05	Improved traveling wave maser amplifie NPO-10548 B6		01
CONTROLLABILITY Controllability of distributed-parameters systems			One hundred angstrom niobium wire LEWIS-10128 B6	58-10279	03
M-FS-14929	B68-10346	20	Method for making small pointed	•	
CONTROLLERS Design techniques - Stochastic contr MSC-11554	rollers B68-10234	02	thermocouples	68-10389	01
CONVECTIVE FLOW Study of convective magnetohydrodyna		UZ	Temperature controlled strain gaged extensometer LEWIS-10353 B6	68-10543	01
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Contact-spring forming machine for conductor cable receptacles M-FS-20126	flat B68-10550	05		58-10561	03
COPPER COMPOUNDS		*	CRACK PROPAGATION Automatic system nondestructively moni	itors	
Microprobe investigation of brittle segregates in aluminum MIG and T	IG welds	0.7 ×	and records fatigue crack growth LANGLEY-10091 B6	58-10379	01
M-FS-14720	B68-10334	03	Effects of high frequency current in w	elding	
Coolants with selective optical file characteristics for ruby laser approximately control of the	plications	00	aluminum alloy 6061 M-FS-18337 B6	58-10383	05
M-FS-20188	B68-10508	02	CRACKING (FRACTURING)		
CORRECTION  Elementary review of electron micro	probe		Weld microfissuring in Inconel 718 minimized by minor elements		
techniques and correction require ARG-10062		03	M-FS-18185 B6		03
CORRELATION COEFFICIENTS			Pre-weld heat treatment improves welds Rene 41	; in	
The X square statistic and goodness test	s of fit	•			03
GSFC-10547	B68-10136	02	Effects of high frequency current in w aluminum alloy 6061		05
CORROSION  High-emittance coatings on metal so				10-10303	US
LEWIS-10325	B68-10381	03	Fiberglass prevents cracking of polyurethane foam insulation on cryo	ogenic	
CORROSION PREVENTION Structural thermal-control coating:	3		vessels M-FS-20058 B6	68-10406	02
NPO-10785	B68-10553	03	CRACKS		
CORROSION RESISTANCE Stress-corrosion characteristics of	f aluminum		Predicting fatigue life of metal bello		05
casting alloy M-45 M-FS-14817	B68-10184	03	Experiments with ceramic coatings M-FS-18150 B6	68-10355	03
Consolidation and fabrication tech for vanadium-20 w/o titanium /TV-			CRANES		
ARG-10148	B68-10368	03	Hoisting frame facilitates handling of objects	large	
Precise doping of metals by small				68-10575	05
LEWIS-10444	B68-10526	03	CREEP PROPERTIES		
Improved thermal treatment of alum allow 7075	inum		Nickel base alloy with improved stress rupture properties	3	
M-FS-20083	B68-10534	05		68-10344	03
CORROSION TESTS  Effects of high frequency current	in welding		Precise doping of metals by small gas LEWIS-10444 B6		03
aluminum alloy 6061 M-FS-18337	B68-10383	05	CREEP RUPTURE STRENGTH Nickel base alloy with improved stress	•	
COULOMETERS			rupture properties		03
Charge control of nickel-cadmium by coulometer and third electrod	e method			68-10344	Ų3
GSFC-10487 COUNTERS	B68-10431	. 01	CROSS CORRELATION Acquisition of pseudonoise signals by sequential estimation		
Self-correcting, synchronizing rin				68-10258	01
using integrated circuit devices M-FS-13901	B68-10067	01	Improvement in recording and reading		
Recharge unit provides for optimum			holograms ERC-10151 B6	68-10347	02
recharging of battery cells GSFC-10688	B68-10273	01	CROSS COUPLING		
Closed circuit TV system automatic			Multichip packaging with thermal insul		20
guides welding arc M-FS-20084	B68-10357	01	CROSS SECTIONS		
COUNTING	200 10001		Machining technique prevents undercutt	ting	
Detection sensitivities in 3-8 MeV			in tensile specimens LANGLEY-10281 Be	68-10352	05
neutron activation ARG-10210	B68-10298	02	Rating of electrical wires in vacuum		
COUPLINGS			environments MSC-15108 B6	68-10362	01
Tube joint leak repair coupling MSC-15022	B68~10540	05	Design of fluid-duct bends with low		
CRACK INITIATION			pressure loss	68-10395	05
Study of crack initiation phenomen				22 10030	
associated with stress corrosion aluminum alloys			CRYDGENIC EQUIPMENT Simple test for physical stability of	,	
M-FS-14283	B68-10153	03	cryogenic tank insulation M-FS-12547 B6	68-10048	03
Experiments with ceramic coatings M-FS-18150	B68~10355	03	Study of cryogenic container thermody	namics	
Weld joint strength and mechanical			during propellant transfer	68-10108	02

Silicon strain sensors enable press measurement at cryogenic temperat M-FS-14703		01	compounds ARG-10092	B68-10198	03
Viscosity and density of methanol/w	ater		CRYSTALLINITY Evaluation of a fluorocarbon plasti	c used	
mixtures at low temperatures M-FS-14991	B68-10274	03	in cryogenic valve seals M-FS-18189	B68-10523	03
Superconductive thin film makes con-	venient		Electron beam recrystallization of	amorphous	
liquid helium level sensor LANGLEY-10289	B68-10341	01	semiconductor materials LEWIS-10443	B68-10556	02
Fiberglass-reinforced structural ma	terials		CRYSTABLOGRAPHY		
for aerospace application M-FS-14806	B68-10360	03	Grain-boundary migration in KCl bic ARG-10181	rystals B68-10455	03
Fiberglass prevents cracking of			CRYSTALS		
polyurethane foam insulation on c vessels	ryogenic		Liquid crystal calibrator M-FS-14151	B68-10221	03
M-FS-20058	B68-10406	02		DOG-10221	00
Hand-tightened, high-pressure seal M-FS-18416	DC0 10417	0.5	Technique developed for measuring transmittance of optical birefring	gent	
	B68-10417	05	networks M-FS-14267	B68-10260	02
Dual-purpose chamber-cooling system NPO-10467	B68-10506	SO	Correction for losses in optical		
Evaluation of a fluorocarbon plastic	c used		birefringent networks, a concept M-FS-20088	B68-10571	02
in cryogenic valve seals M-FS-18189	B68-10523	03	CULTURE TECHNIQUES		
CRYOGENIC FLUIDS			A microlagoon technique for the cul mammalian cells	ture of	
Cryogenic liquid level measuring pr ARG-10138	obe B68-10291	01	LANGLEY-10407	B68-10554	04
Temperature controlled strain gaged	200 10021	01	CURING  Cure of epoxy resins determined by		
extensometer LEWIS-10353	B68-10543	0.1	simple tests M-FS-13131	DC0 10047	03
	B00-10343	01		B68-10043	03
CRYDGENIC MAGNETS Rectangular configuration improves			CURIUM  Portable, high intensity isotopic n		
superconducting cable ARG-90088	B68-10098	02	source provides increased experim accuracy		
CRYOGENICS			ARG-90250	B68-10243	02
Panelized high performance multilay insulation	er		CURIUM 242 Detection sensitivities in 3-8 MeV		
M-FS-14023	B68-10031	03	neutron activation ARG-10210	B68-10298	02
Thermal short improves sensitivity cryogenically cooled maser	of		CURRENT DISTRIBUTION		
NPO-09975	B68-10059	01	Rating of electrical wires in vacuu environments	m	
Development of biaxial test fixture includes cryogenic application			MSC-15108	B68-10362	01
M-FS-14185	B68-10070	01	CURRENT REGULATORS  Nondestructive test determines over	load	
Weld microfissuring in Inconel 718 minimized by minor elements			destruction characteristics of cu limiter fuses		
M-FS-18185	B68-10251	03	XGS-08566	B68-10364	01
One-dimensional reacting gas nonequ performance program	ilibrium		Improved limiter for turn-on curren transient	t	
MSC-11777	B68-10375	06	GSFC-10413	B68-10384	01
Axisymmetric reacting gas nonequili	brium		CUTTERS	•	*
performance program MSC-11781	B68-10377	06	Thread cutting with 3-axis N/C mill machine	•	
CRYOSTATS			LANGLEY-10017	B68-10055	06
Superconducting switch permits meas of small voltages at cryogenic te	mperatures		Coaxial cable stripper for confined KSC-10167	areas B68-10444	05
ARG-90260	B68-10087	01	CUTTING		
CRYSTAL FILTERS Noise figure measurement concept fo			Manual of industrial diamonds plus and grinding criteria for machini		
		01	Manual of industrial diamonds plus		05
Noise figure measurement concept fo acoustic amplifiers	r	01	Manual of industrial diamonds plus and grinding criteria for machini superalloys	ng B68-10239	05
Noise figure measurement concept fo acoustic amplifiers GSFC-10066	r B68-10272	01	Manual of industrial diamonds plus and grinding criteria for machini superalloys M-FS-14582	ng B68-10239	05
Noise figure measurement concept fo acoustic amplifiers GSFC-10066 CRYSTAL GROWTH Grain-boundary migration in KCl bic ARG-10181 Electron beam recrystallization of	r B68-10272 rystals B68-10455		Manual of industrial diamonds plus and grinding criteria for machini superalloys M-FS-14582 Machining technique prevents underc in tensile specimens LANGLEY-10281	ng B68-10239 utting B68-10352	
Noise figure measurement concept fo acoustic amplifiers GSFC-10066 CRYSTAL GROWTH Grain-boundary migration in KCl bic ARG-10181	r B68-10272 rystals B68-10455		Manual of industrial diamonds plus and grinding criteria for machini superalloys M-FS-14582  Machining technique prevents underc in tensile specimens LANGLEY-10281  CYCLES System measures arc energy dissipat relay contact cycling	ng B68-10239 utting B68-10352	05
Noise figure measurement concept fo acoustic amplifiers GSFC-10066 CRYSTAL GROWTH Grain-boundary migration in KCl bic ARG-10181 Electron beam recrystallization of semiconductor materials	r B68-10272 rystals B68-10455 amorphous B68-10556	03	Manual of industrial diamonds plus and grinding criteria for machini superalloys M-FS-14582  Machining technique prevents underc in tensile specimens LANGLEY-10281  CYCLES System measures arc energy dissipat	ng B68-10239 utting B68-10352	

CYCLOTRON RADIATION  An economical method for the contin production of iodine-123	uous		of complex systems M-FS-14133	B68-10252	02
LEWIS-10518	B68-10433	03	Electronic component reliability and	alysis	
CYLINDRICAL BODIES			by data reduction system NPO-10243	B68-10507	05
Compressible sleeve provides automa		,			
centering for grinding or turning cylinders	of		DATA RETRIEVAL  JPKWIC - General key word in context	t and	
SAN-10021	B68-10318	05	subject index report generator	. unu	
Modified sine bar device measures s	11		NPO-10589	B68-10208	06
angles with high accuracy	ama11		A request-oriented information selec	tion	
GSFC-438	B68-10322	02	program	200 10/51	
Electron beam selectively seals por	ous metal		LEWIS-10255	B68-10451	06
filters	200 - 000		Long-term data storage and retrieval	Ĺ	
LEWIS-10162	B68-10331	05	system, a concept M-FS-14789	B68-10505	01
CYTOLOGY					
A microlagoon technique for the cul mammalian cells	ture of		Operational integrator NPO-10230	B68-10547	01
LANGLEY-10407	B68-10554	04	DAGA GAMPI TWO		
<b>D</b>			DATA SAMPLING  Design techniques - Stochastic contr	rollers	
D			MSC-11554	B68-10234	02
DAMPING Flexible ring baffles for damping l	iauid		DATA SMOOTHING		
slosh	-		New technique for optimal smoothing		
LANGLEY-90194	B68-10064	05	MSC-11354	B68-10060	02
Sleeved damper limits spring surgin			Computer graphics data conditioning		
MSC-12071	B68-10111	05	M-FS-14695	B68-10296	06
Vibration testing and dynamic studi	es of		DATA STORAGE		
relays M-FS-14542	B68-10268	01	Hydra 1 data display system MSC-11594	B68-10155	01
		01	NBC-11054	D00-10100	Ų.I
Indium adhesion provides quantitati measure of surface cleanliness	ve		Improvement in recording and reading holograms	j	
SAN-10024	B68-10342	01	ERC-10151	B68-10347	02
One-dimensional coulomb-damped wave	motion		A request-oriented information selec	ation	
in prismatic bars			program		
M-FS-14815	B68-10548	02	LEWIS-10255	B68-10451	06
DATA ACQUISITION			Long-term data storage and retrieval	l	
Silicon surface barrier detectors u liquid hydrogen density measureme			system, a concept M-FS-14789	B68-10505	01
M-FS-14115	B68-10166	01		200	
High-speed camera synchronization			DATA TRANSMISSION Accumulator for shaft encoder		
M-FS-18062	B68-10282	02	M-FS-13599	B68-10093	01
DATA CONVERTERS	•		Deep space FM system, a concept		
Concept for simplified serial digit	al		MSC-11825	B68-10289	01
decoder NPO-10150	B68-10045	06	Simultaneous message framing and erm	ror	
		• •	detection		
Parallel-to-serial biphase-data com MSC-11600	verter B68-10241	01	MSC-12001	B68-10330	01
			Two-way digital driver/receiver use:	s one	
DATA CORRELATION Analysis of annular combustors			set of lines ERC-10055	B68-10437	01
LEWIS-10399	B68-10356	06			
DATA PROCESSING			DECISION MAKING  Development of Electronic Data Proce	essina	
Principles of optical-data processi	ing		/EDP/ augmented management system	•	
techniques GSFC-10271	B68-10069	01	M-FS-14715	B68-10287	06
			DECODERS		
Silicon surface barrier detectors u liquid hydrogen density measureme			Concept for simplified serial digital decoder	al	
M-FS-14115	B68-10166	01	NPO-10150	B68-10045	06
Development of Electronic Data Proc	essina		Simplified, high-speed binary data		
/EDP/ augmented management system	n -		decoder		
M-FS-14715	B68-10287	06	NPO-10118	B68-10058	01
Fully automatic telemetry data proc			Simultaneous message framing and er	ror	
GSFC-10576	B68-10336	01	detection MSC-12001	B68-10330	01
DATA RECORDERS			•		
Recharge unit provides for optimum recharging of battery cells			Fluidic-thermochromic display device ERC-10031	e B68-10350	01
GSFC-10688	B68-10273	01			
DATA REDUCTION			DECOMPOSITION  Metabolic and toxicological effects	of	
New method for critical failure pre	diction		water-soluble xenon compounds are		

DEEP SPACE SUBJECT INDEX

ARG-90239	B68-10076	04	Communication system features dual mode range acquisition plus time delay	
Decomposition vessel GSFC-10343	B68-10104	03	measurement M-FS-14323 B68-10306	01
Fire retardant foams developed to	SUDDERSS		DEMODULATORS	
fuel fires	ouppiooo ,		Concept for simplified serial digital	
ARC-10098	B68-10358	03	decoder NPO-10150 B68-10045	06
Improved process for epitaxial dep				
of silicon on prediffused substr M-FS-14910	B68-10390	03	Deep space FM system, a concept MSC-11825 B68-10289	01
DEEP SPACE			DENSITY (MASS/VOLUME)	
Deep space FM system, a concept MSC-11825	B68-10289	01	Viscosity and density of methanol/water mixtures at low temperatures	
MSC-11023	B00-10209	01	M-FS-14991 B68-10274	03
DSN seven day/twelve week schedule				
NPO-10752	B68-10410	06	Fire retardant foams developed to suppress fuel fires	
DEEP SPACE INSTRUMENTATION FACILITY			ARC-10098 B68-10358	03
Computer program for machine desig Cassegrain feed systems	n of		Fiberglass-reinforced structural materials	
NPO-10588	B68-10421	06	for aerospace application	
PEED STAST MERUODY			M-FS-14806 B68-10360	03
DEEP SPACE NETWORK  DSN seven day/twelve week schedule	program		DENSITY MEASUREMENT	
NPO-10752	B68-10410	06	Instrumentation for bone density measurement	
DEFECTS			MSC-11388 B68-10140	01
Weld microfissuring in Inconel 718	1		Real fluid properties of normal and	
minimized by minor elements M-FS-18185	B68-10251	63	parahydrogen LEWIS-10458 B68-10361	06
n-13-10100	000-10201	00	PPMID 10400	••
Effects of surface preparation on	quality		A mass flux probe for measurement in a supersonic stream	
of aluminum alloy weldments M-FS-13152	B68-10302	03	LEWIS-10695 B68-10533	92
PP#				
DEFLECTION  High efficiency, high frequency ma	anetic		DEOXYRIBONUCLEIC ACID Study of radiation effects on mammalian cells	
deflection driver			in vitro	••
MSC-11597	B68-10116	01	ARG-10191 B68-10294	02
Deflection circuit monitors force	on object		DEPOSITION	
under water NUC-10147	B68-10147	01	Ion plating technique improves thin film deposition	
			SAN-10006 B68-10212	03
Shock-absorbing caster wheel is si compact	mple and		Improved process for epitaxial deposition	
SAN-10019	B68-10266	05	of silicon on prediffused substrates	
Conceptual hermetically sealed elb	10H		M-FS-14910 B68-10390	03
actuator			DEPOSITS	
M-FS-14710	B68-10300	05	Monitor senses amount of contamination deposited on surfaces	
Electron beam selectively seals po	rous metal		GSFC-10212 B68-10089	01
filters LEWIS-10162	B68-10331	05	Detection of effect of deposits on optical	
	DOO TOOOT		windows of pyrometer measurements	
DEFLECTORS	evator.		LEWIS-10366 B68-10367	01
Improved electro-optical tracking M-FS-14791	B68-10311	01	DESTRUCTIVE TESTS	
Two-fluid impinging-shoot injects	. m		High-temperature bearing-cage materials LEWIS-10403 B68-10176	05
Two-fluid, impinging-sheet injecto NPO-10547	B68-10338	05		30
DEGRADATION			DETECTION  Detection and location of metallic objects	<i>₃</i> *
Heat treatment procedure to increa	ise		imbedded in nonmetallic structures	-
ductility of degraded nickel all	loy B68-10029	0.7	M-FS-14790 B68-10183	01
M-FS-12410	000-10029	03	Detection of effect of deposits on optical	
DEGREES OF FREEDOM			windows of pyrometer measurements	01
Computer program determines vibrat three-dimensional space of hydra			LEWIS-10366 B68-10367	01
excited by forced displacements			Automatic system nondestructively monitors	
M-FS-12226	B68-10159	06	and records fatigue crack growth LANGLEY-10091 B68-10379	01
Shock and vibration response of mu	ultistage			
structure M-FS-14972	B68-10353	05	Training manuals for nondestructive testing using magnetic particles	
	200 10000	••	M-FS-20187 B68-10391	03
DEMODULATION Facsimile video enhancement device	•		DETECTORS	
GSFC-10185	B68-10207	01	Method of maintaining activity of	
Improved relay optical element for	•		hydrogen-sensing platinum electrode M-FS-1422 B68-10049	03
spectroradiometer using cryogen				0.5
cooled detector MSC-11688		0.2	Synthesis of electro-optic modulators for amplitude modulation of light	
M9C-11000	B68-10245	02	ampirtude modulation or fight	

M-FS-14268	B68-10275	02	circuit capacitors LANGLEY-10294	B68-10542	01
Optimetric system facilitates color and fluorometric measurements NPO-10233	imetric B68-10316	01	DIETS Food products for space application		
Automatic patient respiration failu			MSC-11697	B68-10324	04
detection system with wireless tr ARC-10174		01	DIFFERENCE EQUATIONS Digital filter synthesis computer p ARC-10130	rogram B68-10164	06
DETERMINANTS			TDACK		
Linear systems of equations solved mathematical algorithms ARG-10146	B68-10292	06	Computer program TRACK performs tra and/or steady state thermal analy coupled fluid flow and heat condu NUC-10189	sis with	06
DETONATION Continuous detonation reaction engi M-FS-14019	ne B68-10034	03	DIFFERENTIAL AMPLIFIERS Amplifier improvement circuit LEWIS-10712	B68-10456	01
DEUTERIUM  The preparation, identification and properties of chlorophyll derivat ARG-10205		03	DIFFERENTIAL EQUATIONS  Tool reconstructs data input points  corresponding to first order outp  M-FS-18003		02
DEVIATION FORTRAN optical lens design program NPO-10603	B68-10354	06	Computer program determines system stability /DIGSTA/ LEWIS-10395	B68-10216	06
DIAGNOSIS	_				
Electrocardiograph transmitted by R telephone links in emergency situ FRC-10031		01	HICOV /Newton-Raphson calculus of variation with automatic transver M-FS-14468	salities/ B68-10232	06
DIAMONDS  Manual of industrial diamonds plus and grinding criteria for machini superalloys			Solution of differential equations application of transformation gro M-FS-14802		02
M-FS-14582	B68-10239	05	Controllability of distributed-para	meter	
One hundred angstrom niobium wire LEWIS-10128	B68-10279	03	systems M-FS-14929	B68-10346	20
Preparing rock powder specimens of controlled size distribution NPO-10007	B68-10297	05	CIRCUSA digital computer program transient analysis of electronic M-FS-15002		06
			Solving nonlinear heat transfer con	stant	
DIAPHRAGMS Dual rate pressure relief valve MSC-11606	B68-10237	05	area fin problems M-FS-14851	B68-10504	02
DIAPHRAGMS (MECHANICS)			Accurate digital technique simulate control system	_	
Miniature pressure transducer for s member application	tressed		M-FS-14787	B68-10569	02
MSC-11869	B68-10246	01	Improved technique for digital simu of bending and slosh phenomena	lation	
Silicon strain sensors enable press measurement at cryogenic temperat			M-FS-14788	B68-10570	02
M-FS-14703	B68-10262	01	DIFFERENTIAL PRESSURE Quasi-static vapor pressure measure	ments	
DICHROISM Color-televised medical microscopy MSC-13086	DGO 1071/		on reactive systems in inert atmo ARG-90142		01
MSC-13000	B68-10314	01 ·	DIFFERENTIATORS		
DIELECTRIC PROPERTIES  Glass coated single grid for charge particle acceleration	:d		Gimbal angle sensor GSFC-10305	B68-10315	01
LEWIS-10106	B68-10215	03	DIFFRACTION  One hundred angstrom niobium wire		
Cryogenic liquid level measuring pr ARG-10138	obe B68-10291	01	LEWIS-10128 DIFFRACTOMETERS	B68-10279	03
Thermal conductivity and dielectric of silicate materials			Improved optical diffractometer MSC-12055	B68-10071	02
M-FS-14856	B68-10351	03	DIFFUSERS		
DIELECTRICS Improved process for making thin-fi niobate capacitors			Venturi meter with separable diffus LEWIS~10483	er B68-10295	05
MSC-11231	B68-10163	01	Analysis of annular combustors LEWIS-10399	B68-10356	06
Moebius resistor is noninductive an nonreactive SAN-10020	B68-10267	01	DIFFUSION Improved fuel-cell-type hydrogen se M-FS-14656	nsor B68-10263	01
Nondestructive method for measuring stresses in metals, a concept KSC-10237		03	Dynamics of moving bubbles in singl		
	B68-10378	U-J	binary component systems M-FS-14845	B68-10339	02
High dielectric thick films for scr	eenea				

DIFFUSION WELDING SUBJECT INDEX

High-emittance coatings on metal sub LEWIS-10325	strates B68-10381	03	ERC-10055	B68-10437	01
DIFFUSION WELDING Laminated sheet composites reinforce	d with		DIGITAL TECHNIQUES  Digital filter synthesis computer p  ARC-10130	rogram B68-10164	06
modular filament sheet	B68-10146	03	Acquisition of pseudonoise signals		
Roll diffusion bonding of titanium a		0.5	sequential estimation M-FS-13898	B68-10258	01
panel s M-FS-14743	B68-10161	05	Closed circuit TV system automatica	llv	
Fluidic-thermochromic display device			guides welding arc M-FS-20084	B68-10357	01
ERC-10031	B68-10350	01	Computer program for parameter		
DIGITAL COMPUTERS Instrumentation for bone density mea MSC-11388	surement B68-10140	01	optimization ARC-10168	B68-10453	06
ELAS - A general purpose computer pr for the equilibrium problems of li			Operational integrator NPD-10230	B68-10547	01
structures	B68-10187	06	Accurate digital technique simulate control system	_	
Linear systems of equations solved u	sing		M-FS-14787	B68-10569	20
mathematical algorithms	B68-10292	06	Improved technique for digital simu of bending and slosh phenomena		
Study of optimum discrete estimators	in		M-FS-14788	B68-10570	02
measurement analysis M-FS-14915	B68-10348	02	Digital computer technique for setu checkout of an analog computer	p and	
Improved technique for digital simul		02	M-FS-13969	B68-10576	06
of bending and slosh phenomena			DIGITAL TO ANALOG CONVERTERS		
	B68-10570	02	Closed circuit TV system automatica guides welding arc		
DIGITAL DATA Digital data averager improves conve	ntional		M-FS-20084	B68-10357	01
measurement system performance	B68-10018	01	DIMPLING Tube dimpling tool assures accurate		
		0.1	dip-brazed joints		
Analysis of flutter in tape transpor systems	t		MSC-533	B68-10036	05
M-FS-11970	B68-10027	01	DIODES Feasibility study of wireless power		
Concept for simplified serial digita decoder	1		transmission systems M-FS-14691	B68-10309	01
	B68-10045	.06`		B00-10309	01
Method of reducing time base error i	n		System measures response time of photomultiplier tubes	760 14700	
digital magnetic recorders GSFC-10108	B68-10317	01	LEWIS-10437	B68-10382	01
Short circuit protection for a power			Pressure-sensitive bonded junction transducers		
distribution system M-FS-14993	B68-10443	01	ERC-10087	B68-10563	01
DIGITAL INTEGRATORS			DIOXIDES Study of mechanical properties of u	ranium	
Operational integrator	B68-10547	01	compounds ARG-10074	B68-10197	03
	D00-10347	01		B00-10197	Ų3
DIGITAL SIMULATION Accurate digital technique simulates control system	flight		DIRECT CURRENT Linear analog dc voltage-to-pulse-w converter	idth	
	B68-10569	02	GSFC-556	B68-10003	01
Improved technique for digital simul	ation		Regulated dc-to-dc converter feature	es low	-39
of bending and slosh phenomena M-FS-14788	B68-10570	02	power drain GSFC-03429	B68-10017	01
DIGITAL SYSTEMS Digital filter suppresses effects of			Improved dc voltage multiplier M-FS-14042	B68-10074	01
nonstatistical noise bursts on mul scaler digital averaging systems ARG-90143	11channel B68-10193	06	Precision bolometer bridge MSC-11473	B68-10156	01
Recharge unit provides for optimum			Synthesis of electro-optic modulato	rs for	
recharging of battery cells GSFC-10688	B68-10273	01	amplitude modulation of light M-FS-14268	B68-10275	02
Method of reducing time base error i digital magnetic recorders GSFC-10108	n B68-10317	01	Analysis and design of a class-D am M-FS-14803	plifier B68-10313	01
	POO-INSTI	01	Concept to convert electrical power		
High-speed pulse camera MSC-11353	B68-10329	02	GSFC-10222	B68-10321	01
Two-way digital driver/receiver uses set of lines	one		Power consumption in acoustic ampli under conditions of maximum stabl GSFC-10067		01

Application of the solid lubricant molybdenum disulfide by sputteri LEWIS-10544		03	Improved gas ring laser MSC-11584	B68-10304	02
DIRECTIONAL ANTENNAS	200 200.0		Laser Doppler gas-velocity instrumen M-FS-20039	t B68 <b>~</b> 10349	02
Single degree of freedom antenna p program /ANTENA/	ointing		DOSAGE	200 10042	02
NPO-10756	B68-10449	06	Experimental study and evaluation of	•	
DISCHARGE COEFFICIENT			radioprotective drugs ARG-10196	B68-10320	04
Analysis of annular combustors LEWIS-10399	B68-10356	06	DOSIMETERS		
DISCONNECT DEVICES	200 10000		Electronic gating circuit and ultrav		
Remotely operated gripper provides	vertical		laser excitation permit improved d sensitivity		
control rod movement ÁRG-10160	B68-10359	05		B68-10077	02
Pyrotechnic-actuated cable release			Ceric and ferrous dosimeters show pr for 50-5000 rad range	ecision	
XNP-10849	B68-10535	05	ARG-10173	B68-10426	02
DISCONTINUITY  Method for reducing snap in magnet	ic		Readout system for radiation detecto MSC-90180	B68-10501	01
amplifiers LEWIS-10388	B68-10388	01	DRAFTING (DRAWING)		
DISCRIMINATORS			Photographic and drafting techniques simplify method of producing engin		
Dynamic linearity measurement tech KSC-10186	nique B68-10290	01	drawings MSC-716	B68-10128	02
Laser Doppler gas-velocity instrum	ent		DRAWINGS		
M-FS-20039	B68-10349	02	Projection transparencies from print material	:ed	
DISPENSERS				B68-10112	01
Dispensing graduate for butadiene NPO-10070	B68-10524	03	DROPOUTS		
DISPLAY DEVICES			Phase-lock loop frequency control an dropout problem	id the	
Hydra 1 data display system MSC-11594	B68-10155	01	M-FS-13948	B68-10130	01
Computer graphics data conditionin		V-	DROPS (LIQUIDS) System for measuring spatial distrib	untion of	
M-FS-14695	B68-10296	06	ejected droplets, a concept		
Random access-random release relay				B68-10402	01
switching matrix M-FS-12590	B68-10301	01	DUCTILITY  Heat treatment procedure to increase	<b>&gt;</b>	
Fluidic-thermochromic display devi	ce		ductility of degraded nickel alloy M-FS-12410	8 B68-10029	03
ERC-10031	B68~10350	01	Weld microfissuring in Inconel 718		
Selective video blanking technique M-FS-20013	B68-10434	01	minimized by minor elements M-FS-18185	DC0 103E1	0.7
	B00-10434	01		B68-10251	03
DISTILLATION EQUIPMENT Distillation device supplies cesiu	m vapor at		High temperature alloy LEWIS-10377	B68-10253	03
constant pressure XNP-08124	B68-10020	03	Fabrication techniques developed for	· small-	
DISTRIBUTING			diameter, thin-wall tungsten and t alloy tubing	ungsten	
Controllability of distributed-par systems	ameter	•	ARG-10100	B68-10284	05
M-FS-14929	B68-10346	0.5	Pre-weld heat treatment improves wel	ds in	
DISTRIBUTION FUNCTIONS			Rene 41 M-FS-18174	B68-10285	03
Solution of differential equations application of transformation gr	oups		Nickel base alloy with improved stre	255	
M-FS-14802	B68-10276	02	rupture properties LEWIS-10283	B68-10344	03
DOCUMENTATION  A request-oriented information sel	ection		Nickel-base superalloy*s excellent		
program LEWIS-10255	B68-10451	06	properties promote its service to degrees F	2200	
	100-10431	00	LEWIS-10355	B68-10380	03
DOCUMENTS Principles of optical-data process	ing		DUCTS		
techniques GSFC-10271	B68-10069	01	Design of fluid-duct bends with low pressure loss		
DOPPLER EFFECT			M-FS-20176	B68-10395	05
Communication system features dual range acquisition plus time dela			DURABILITY Spiral-grooved shaft seals substanti	iallý	
measurement M-FS-14323	B68-10306	01	reduce leakage and wear LEWIS-10397	B68-10270	05
DOPPLER RADAR			Compact rotating cup anemometer		
Acquisition of pseudonoise signals	ьр		NPO-10563	B68-10436	01
sequential estimation M-FS-13898	B68-10258	01			

DUST			EDUCATIONAL TELEVISION		
Vacuum probe sampler removes micron-	sized		Color-televised medical microscopy		
particles from surfaces SAN-10003	B68-10231	04	MSC-13086	B68-10314	01
5AN-10003	000-10231	04	EIGENVALUES		
DYES	,		Controllability of distributed-param	ieter	
Weld microfissuring in Inconel 718			systems	200 100/0	
minimized by minor elements M-FS-18185	B68-10251	03	M-FS-14929	B68-10346	02
11 15 10100	000 10201	•••	EIGENVECTORS		
DYNAMIC CHARACTERISTICS			Controllability of distributed-param	ieter	
Dynamic-reservoir lubricating device		05	systems M-FS-14929	B68-10346	02
M-FS-14652	B68-10261	UĐ	n-F5-14929	D00-10240	02
Dynamic linearity measurement techni	que		ELASTIC PROPERTIES		
KSC-10186	B68-10290	01	Vibration testing and dynamic studie	s of	
Dynamics of moving bubbles in single	and		rel ays M-FS-14542	B68-10268	01
binary component systems	unu				٠.
M-FS-14845	B68-10339	02	Conceptual hermetically sealed elbow	,	
DYNAMIC LOADS			actuator M-FS-14710	B68-10300	05
Nondestructive testing of brazed roc	:ket		H-1 2-141 10	BCC 10000	••
engine components			ELASTOHYDRODYNAMICS		
M-FS-18191	B68-10394	03	High-temperature bearing lubricants LEWIS-10408	B68-10249	05
Fatigue of reinforced concrete beams	under		LEW15-10400	D00-10249	vo
dynamic loading			ELASTOMERS		
M-FS-14980	B68-10515	05	Compressible sleeve provides automat		
DYNAMIC PROGRAMMING			centering for grinding or turning cylinders	01	
Computer program offers new method f	or		SAN-10021	B68-10318	05
constructing periodic orbits in no					
dynamical systems	B68-10217	06	ELECTRIC ARCS  Design concept for nonarcing electric	ical	
M-FS-14654	B00-10217	06	connector	,car	
Study of optimum discrete estimators	in		M-FS-14937	B68-10404	01
measurement analysis			DI DOMDEG DAMMEDTEG		
M-FS-14915	B68-10348	02	ELECTRIC BATTERIES  Zinc-oxygen primary cell yields high	a	
DYNAMIC RESPONSE			energy density		
Cryogenic liquid level measuring pro			M-FS-14661	B68-10218	01
ARG-10138	B68-10291	01	Recharge unit provides for optimum		
DYNAMIC STRUCTURAL ANALYSIS			recharging of battery cells		
Computer program determines vibration			GSFC-10688	B68-10273	01
three-dimensional space of hydraul excited by forced displacements	ic lines		Superconductive thin film makes conv	venient	
M-FS-12226	B68-10159	06	liquid helium level sensor	, chi chi c	
			LANGLEY-10289	B68-10341	01
E			Battery-package design provides for	cell	
			cooling and constraint		
EARTH (PLANET)					
EARTH (PLANET) Theory of a refined earth model			MSC-11839	B68-10398	05
	B68-10228	02		B68-10398	05
Theory of a refined earth model	B68-10228	02	MSC-11839  ELECTRIC BRIDGES  Precision bolometer bridge	B68-10398	05
Theory of a refined earth model M-FS-14679 EARTH ORBITS HICOV /Newton-Raphson calculus of		02	ELECTRIC BRIDGES		05
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transverse	salities/		ELECTRIC BRIDGES Precision bolometer bridge MSC-11473		
Theory of a refined earth model M-FS-14679 EARTH ORBITS HICOV /Newton-Raphson calculus of		02	ELECTRIC BRIDGES Precision bolometer bridge MSC-11473 ELECTRIC CHARGE		
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE	salities/		ELECTRIC BRIDGES  Precision bolometer bridge  MSC-11473  ELECTRIC CHARGE  Recharge unit provides for optimum  recharging of battery cells	B68-10156	01
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model	salities/ B68-10232	06	ELECTRIC BRIDGES  Precision bolometer bridge  MSC-11473  ELECTRIC CHARGE  Recharge unit provides for optimum	B68-10156	
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE	salities/		ELECTRIC BRIDGES Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688	B68-10156	01
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model	salities/ B68-10232	06	ELECTRIC BRIDGES  Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium ba by coulometer and third electrode	B68-10156 B68-10273 tteries method	01
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of	B68-10228	06	ELECTRIC BRIDGES  Precision bolometer bridge MSC-11473  ELECTRIC CHARGE  Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium ba	B68-10156 B68-10273 tteries method	01
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of imbedded in nonmetallic structures	B68-10232 B68-10228	06	ELECTRIC BRIDGES  Precision bolometer bridge MSC-11473  ELECTRIC CHARGE  Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium ba by coulometer and third electrode GSFC-10487	B68-10156 B68-10273 tteries method	01
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of	B68-10228	06	ELECTRIC BRIDGES  Precision bolometer bridge  MSC-11473  ELECTRIC CHARGE  Recharge unit provides for optimum  recharging of battery cells  GSFC-10688  Charge control of nickel-cadmium baby coulometer and third electrode  GSFC-10487  ELECTRIC CHOPPERS  Improved relay optical element for	B68-10156 B68-10273 tteries method B68-10431	01
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of imbedded in nonmetallic structures M-FS-14790  Stress-corrosion-induced property cl	B68-10232  B68-10228  Dbjects B68-10183	06	ELECTRIC BRIDGES  Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium baby coulometer and third electrode GSFC-10487  ELECTRIC CHOPPERS Improved relay optical element for spectroradiometer using cryogenic	B68-10156 B68-10273 tteries method B68-10431	01
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Stress-corrosion-induced property clin aluminum alloys	B68-10232  B68-10228  Dbjects  B68-10183  hanges	06	ELECTRIC BRIDGES Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium ba by coulometer and third electrode GSFC-10487  ELECTRIC CHOPPERS Improved relay optical element for spectroradiometer using cryogenic cooled detector	B68-10156  B68-10273  tteries method B68-10431	01
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of imbedded in nonmetallic structures M-FS-14790  Stress-corrosion-induced property cl	B68-10232  B68-10228  Dbjects B68-10183	06	ELECTRIC BRIDGES  Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium baby coulometer and third electrode GSFC-10487  ELECTRIC CHOPPERS Improved relay optical element for spectroradiometer using cryogenic	B68-10156 B68-10273 tteries method B68-10431	01
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of imbedded in nonmetallic structures M-FS-14790  Stress-corrosion-induced property of in aluminum alloys M-FS-20209  EDUCATION	B68-10232  B68-10228  Dbjects B68-10183  hanges B68-10568	06	ELECTRIC BRIDGES Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium ba by coulometer and third electrode GSFC-10487  ELECTRIC CHOPPERS Improved relay optical element for spectroradiometer using cryogenic cooled detector MSC-11688  High-efficiency step-up regulator	B68-10156  B68-10273  tteries method B68-10431  ally B68-10245	01 01 02
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of imbedded in nonmetallic structures M-FS-14790  Stress-corrosion-induced property cl in aluminum alloys M-FS-20209  EDUCATION Product identification techniques us	B68-10232  B68-10228  Dbjects B68-10183  hanges B68-10568	06	ELECTRIC BRIDGES Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium baby coulometer and third electrode GSFC-10487  ELECTRIC CHOPPERS Improved relay optical element for spectroradiometer using cryogenic cooled detector MSC-11688	B68-10156  B68-10273  tteries method B68-10431	01
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of imbedded in nonmetallic structures M-FS-14790  Stress-corrosion-induced property of in aluminum alloys M-FS-20209  EDUCATION	B68-10232  B68-10228  Dbjects B68-10183  hanges B68-10568	06	ELECTRIC BRIDGES Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium ba by coulometer and third electrode GSFC-10487  ELECTRIC CHOPPERS Improved relay optical element for spectroradiometer using cryogenic cooled detector MSC-11688  High-efficiency step-up regulator M-FS-20049  ELECTRIC CONDUCTORS	B68-10156  B68-10273  tteries method B68-10431  ally B68-10245	01 01 02
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of imbedded in nonmetallic structures M-FS-14790  Stress-corrosion-induced property of in aluminum alloys M-FS-20209  EDUCATION Product identification techniques us training aids for analytical chemics SAN-10025	Bes-10232  Bes-10232  Bes-10228  Desired signs and seed as ists Bes-10373	06 02 01	ELECTRIC BRIDGES Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium ba by coulometer and third electrode GSFC-10487  ELECTRIC CHOPPERS Improved relay optical element for spectroradiometer using cryogenic cooled detector MSC-11688  High-efficiency step-up regulator M-FS-20049  ELECTRIC CONDUCTORS Multichannel wireway adapter box	B68-10156  B68-10273  tteries method B68-10431  ally B68-10245  B68-10432	01 01 
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of imbedded in nonmetallic structures M-FS-14790  Stress-corrosion-induced property of in aluminum alloys M-FS-20209  EDUCATION Product identification techniques us training aids for analytical chemics SAN-10025  Training manuals for nondestructive	Bes-10232  Bes-10232  Bes-10228  Desired signs and seed as ists Bes-10373	06 02 01	ELECTRIC BRIDGES Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium ba by coulometer and third electrode GSFC-10487  ELECTRIC CHOPPERS Improved relay optical element for spectroradiometer using cryogenic cooled detector MSC-11688  High-efficiency step-up regulator M-FS-20049  ELECTRIC CONDUCTORS	B68-10156  B68-10273  tteries method B68-10431  ally B68-10245	01 01 02
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of imbedded in nonmetallic structures M-FS-14790  Stress-corrosion-induced property of in aluminum alloys M-FS-20209  EDUCATION Product identification techniques us training aids for analytical chemics SAN-10025	Bes-10232  Bes-10232  Bes-10228  Desired signs and seed as ists Bes-10373	06 02 01	ELECTRIC BRIDGES Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium ba by coulometer and third electrode GSFC-10487  ELECTRIC CHOPPERS Improved relay optical element for spectroradiometer using cryogenic cooled detector MSC-11688  High-efficiency step-up regulator M-FS-20049  ELECTRIC CONDUCTORS Multichannel wireway adapter box MSC-90645 Inspection criteria ensure quality	B68-10156  B68-10273  tteries method B68-10431  ally B68-10245  B68-10432	01 01 
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of imbedded in nonmetallic structures M-FS-14790  Stress-corrosion-induced property of in aluminum alloys M-FS-20209  EDUCATION Product identification techniques us training aids for analytical chemics SAN-10025  Training manuals for nondestructive using magnetic particles M-FS-20187	B68-10228  B68-10228  bjects  B68-10183  hanges  B68-10568  sed as  ists  B68-10373  testing	06 02 01 03	ELECTRIC BRIDGES Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium baby coulometer and third electrode GSFC-10487  ELECTRIC CHOPPERS Improved relay optical element for spectroradiometer using cryogenic cooled detector MSC-11688  High-efficiency step-up regulator M-FS-20049  ELECTRIC CONDUCTORS Multichannel wireway adapter box MSC-90645  Inspection criteria ensure quality of parallel gap soldering	B68-10156  B68-10273  tteries method B68-10431  ally B68-10245  B68-10432	01 01 01 02 01
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of imbedded in nonmetallic structures M-FS-14790  Stress-corrosion-induced property of in aluminum alloys M-FS-20209  EDUCATION Product identification techniques us training aids for analytical chemis SAN-10025  Training manuals for nondestructive using magnetic particles M-FS-20187  Contamination control handbook	B68-10228  bjects B68-10183  hanges B68-10568  sed as ists B68-10373  testing B68-10391	06 02 01 03 03	ELECTRIC BRIDGES Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium ba by coulometer and third electrode GSFC-10487  ELECTRIC CHOPPERS Improved relay optical element for spectroradiometer using cryogenic cooled detector MSC-11688  High-efficiency step-up regulator M-FS-20049  ELECTRIC CONDUCTORS Multichannel wireway adapter box MSC-90645 Inspection criteria ensure quality	B68-10156  B68-10273  tteries method B68-10431  ally B68-10245  B68-10432	01 01 
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of imbedded in nonmetallic structures M-FS-14790  Stress-corrosion-induced property of in aluminum alloys M-FS-20209  EDUCATION Product identification techniques us training aids for analytical chemics SAN-10025  Training manuals for nondestructive using magnetic particles M-FS-20187	B68-10228  B68-10228  bjects  B68-10183  hanges  B68-10568  sed as  ists  B68-10373  testing	06 02 01 03	ELECTRIC BRIDGES Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium baby coulometer and third electrode GSFC-10487  ELECTRIC CHOPPERS Improved relay optical element for spectroradiometer using cryogenic cooled detector MSC-11688  High-efficiency step-up regulator M-FS-20049  ELECTRIC CONDUCTORS Multichannel wireway adapter box MSC-90645  Inspection criteria ensure quality of parallel gap soldering	B68-10156  B68-10273 tteries method B68-10431  ally B68-10245  B68-10432  control B68-10257	01 01 01 02 01
Theory of a refined earth model M-FS-14679  EARTH ORBITS HICOV /Newton-Raphson calculus of variation with automatic transvers M-FS-14468  EARTH SURFACE Theory of a refined earth model M-FS-14679  EDDY CURRENTS Detection and location of metallic of imbedded in nonmetallic structures M-FS-14790  Stress-corrosion-induced property of in aluminum alloys M-FS-20209  EDUCATION Product identification techniques us training aids for analytical chemis SAN-10025  Training manuals for nondestructive using magnetic particles M-FS-20187  Contamination control handbook	B68-10373 testing B68-10392	06 02 01 03 03	ELECTRIC BRIDGES Precision bolometer bridge MSC-11473  ELECTRIC CHARGE Recharge unit provides for optimum recharging of battery cells GSFC-10688  Charge control of nickel-cadmium ba by coulometer and third electrode GSFC-10487  ELECTRIC CHOPPERS Improved relay optical element for spectroradiometer using cryogenic cooled detector MSC-11688  High-efficiency step-up regulator M-FS-20049  ELECTRIC CONDUCTORS Multichannel wireway adapter box MSC-90645  Inspection criteria ensure quality of parallel gap soldering M-FS-14530	B68-10156  B68-10273 tteries method B68-10431  ally B68-10245  B68-10432  control B68-10257	01 01 01 02 01

Concept to convert electrical power GSFC-10222	B68-10321	01	High-voltage pulse generator develop wide-gap spark chambers	ed for	
			ARG-10136	B68-10283	01
Rating of electrical wires in vacuu	m				
environments MSC-15108	B68-10362	01	Method for removing surface-damaged from nickel alloys	layers	
	200 2000	7		B68-10522	03
Contact-spring forming machine for	flat				
conductor cable receptacles			ELECTRIC EQUIPMENT TESTS		
M-FS-20126	B68-10550	. 05	Dc pin-to-pin testing of integrated circuits		
ELECTRIC CONNECTORS				B68-10001	0.1
Inspection criteria ensure quality	control			200 2002	V-
of parallel gap soldering			ELECTRIC FILTERS		
M-FS-14530	B68-10257	05	Improved relay optical element for		
Design concept for nonarcing electr	(an)		spectroradiometer using cryogenica cooled detector	III	-
connector	ICAI			B68-10245	02
M-FS-14937	B68-10404	01		200 10040	•••
			Active RC filter permits easy trade-		
Coaxial cable stripper for confined			of amplifier gain and sensitivity		
KSC-10167	B68-10444	05	ARC-10042	B68-10539	01
ELECTRIC CONTACTS			ELECTRIC FUSES		
Capacitance-coupled wiper increases			Nondestructive test determines overl	oad	
potentiometer life			destruction characteristics of cur	rent	
ARC-10060	B68-10175	01	limiter fuses		
Vibration testing and dynamic studi			XGS-08566	B68-10364	01
relays	es oi		ELECTRIC GENERATORS		
M-FS-14542	B68-10268	01	Electronic load for testing power		
			generating devices		
System measures arc energy dissipat	ed in		NPO-10350	B68-10203	01
relay contact cycling M-FS-14541	B68-10312	01	Utah tampanatuna allau		
W-L9-14941	P08-10315	01	High temperature alloy LEWIS-10377	B68-10253	03
Contact-spring forming machine for	flat		PC#19 140//	DOD 10200	00
conductor cable receptacles			Feasibility study of wireless power		
M-FS-20126	B68-10550	05	transmission systems		
ELECTRIC CONTROL			M-FS-14691	B68-10309	01
Low-cost, fast-response drive circu	it for		Concept to convert electrical power		
electromagnetic torque motors				B68-10321	01
LEWIS-10143	B68-10386	01			
El Bardya augustus			ELECTRIC IGNITION		
ELECTRIC CURRENT Lightweight heater generates high			Evaluation of ignition mechanisms in selected nonmetallic materials	•	
temperatures from low current				B68-10167	03
SAN-10004	B68-10223	01	1.00 12010	200 20201	••
			ELECTRIC NETWORKS		
Welder analyzer	200 10010		Active RC networks of low sensitivit		
MSC-12068	B68-10242	01	integrated circuit transfer functi synthesis	on	
Recharge unit provides for optimum				B68-10210	01
recharging of battery cells					
GSFC-10688	B68-10273	01	Performance analysis of electrical c	ircuits	
Fluidia-thormachumic dia-law dawie			/PANE/ M-FS-15001	B68-10448	0.6
Fluidic-thermochromic display devic ERC-10031	B68-10350	01	u_t g_10001	POG-10440	06
, <del>-</del>			Active RC filter permits easy trade-	-off	
Nondestructive test determines over			of amplifier gain and sensitivity	to gain	
destruction characteristics of cu	rrent		ARC-10042	B68-10539	01
limiter fuses XGS-08566	B68-10364	01	Locating **sneak paths** in electric	· a l	
, and a cooper	200 10004	V-	circuitry		
Method for reducing snap in magneti	c			B68-10565	01
amplifiers	Dag 1		DI DORDITO CHEL DEC		
LEWIS-10388	B68-10388	01	ELECTRIC OUTLETS		
CIRCUSA digital computer program	for		High-torque power wrench, a concept M-FS-18194	B68-10299	05
transient analysis of electronic					
M-FS-15002	B68-10416	06	ELECTRIC POTENTIAL		
· Landing whomas make who is a second	1		Improved limiter for turn-on current	:	
Locating **sneak paths** in electri circuitry	Cdl		transient GSFC-10413	B68-10384	01
M-FS-15018	B68-10565	01	401 4 74374		~ 4
			Electromotive series established for	metals	
ELECTRIC DISCHARGES			used in aerospace technology	DC01 0705	67
Silicon oxide films grown in microw discharge	ave		M-FS-18327	B68-10385	03
discharge M-FS-14634	B68-10171	01	Charge control of nickel-cadmium bat	teries	
	200 101.1		by coulometer and third electrode	method	
Miniature pressure transducer for s	tressed			B68-10431	01
member application	Dec 1001-	0.1	Makkad day and the assessment as		
MSC-11869 .	B68-10246	01	Method for measuring alternator volt transients	age	
Recharge unit provides for optimum				B68-10513	01
recharging of battery cells					
GSFC-10688	B68-10273	01			

ELECTRIC POWER SUBJECT INDEX

ELECTRIC POWER Regulated dc-to-dc converter featu	res low		M-FS-14713	B68-10303	01
power drain GSFC-03429	B68-10017	01	Temperature or pressure controller LEWIS-10297	B68-10337	01
Welder analyzer MSC-12068	B68-10242	01	ELECTRICAL MEASUREMENT Studies in zirconium oxidation ARG-10099	B68-10199	03
Conceptual hermetically sealed elb	OW			500 10155	••
actuator M-FS-14710	B68-10300	05	Welder analyzer MSC-12068	B68-10242	01
ELECTRIC RELAYS			Recharge unit provides for optimum		
Vibration testing and dynamic stud relays	ies of		recharging of battery cells GSFC-10688	B68-10273	01
M-FS-14542	B68-10268	01			01
Random access-random release relay			Nondestructive test determines over destruction characteristics of c		
switching matrix			limiter fuses		
M-FS-12590	B68-10301	01	XGS-08566	B68-10364	01
System measures arc energy dissipa	ted in		Electromotive series established for	or metals	
relay contact cycling M-FS-14541	B68-10312	01	used in aerospace technology M-FS-18327	B68-10385	03
		-			
Improved limiter for turn-on curre transient	nt		Method for measuring alternator volume transients	Itage	
GSFC-10413	B68-10384	01	LEWIS-10373	B68-10513	01
Pyrotechnic-actuated cable release XNP-10849	B68-10535	05	ELECTRICAL RESISTANCE Graphite cloth facilitates vacuum evaporation of silicon monoxide		
ELECTRIC SPARKS			M-FS-14764	B68-10256	03
Effects of surface preparation on of aluminum alloy weldments	quality		Superconductive thin film makes con	nvenient	
M-FS-13152	B68-10302	03	liquid helium level sensor LANGLEY-10289	B68-10341	01
ELECTRIC SWITCHES  Dynamic linearity measurement tech	niane		ELECTRICAL RESISTIVITY		
KSC-10186	B68-10290	01	Resistivity measurements of neutron-irradiated pure metals a	nd Al-Zn	
Random access-random release relay switching matrix			alloys ARG-10108	B68-10200	03
M-FS-12590	B68-10301	01			0.5
ELECTRIC TERMINALS			Moebius resistor is noninductive as nonreactive	nd	
SEAL /Subnetwork Enumeration And			SAN-10020	B68-10267	01
Listing/ ERC-10116	B68-10227	06	System for measuring spatial distr	ibution of	
			ejected droplets, a concept		
ELECTRIC WIRE Standards for compatibility of pri	nted		NPO-10185	B68-10402	01
circuit and component lead mater M-FS-14531		01	Design concept for nonarcing elect: connector	rical	
			M-FS-14937	B68-10404	01
System for measuring spatial distr ejected droplets, a concept	ibution of		Stress-corrosion-induced property	changes	
NPO-10185	B68-10402	01	in aluminum alloys	20 10560	
Conditioning flat conductors for f	lat		M-FS-20209	B68-10568	03
conductor cable production M-FS-14914	B68-10429	01	ELECTRO-OPTICS		
	500-10429	V1	Electro-optic modulator for infrare using gallium arsenide crystal	ed laser	
ELECTRICAL FAULTS Reducing bubbles in glass coatings	improves		GSFC-10686	B68-10255	02
electrical breakdown strength LEWIS-10278	B68-10214	03	Technique developed for measuring transmittance of optical birefri	ngent	-3€
Transistorized Marx bank pulse cir	cuit		networks M-FS-14267	B68-10260	02
provides voltage multiplication nanosecond rise-time	with		Improved electro-ontical tacking	euetem :	
ARG-10110	B68-10328	01	Improved electro-optical tracking : M-FS-14791	B68-10311	01
ELECTRICAL IMPEDANCE			Rapid-response, light-exposure con	trol	
Bilateral, zero-impedance static			system		
semiconductor switch LEWIS-10129	B68-10118	01	NPO-10238	B68-10502	01
			ELECTROCARDIOGRAPHY		
New electrical plethysmograph moni cardiac output	TOPS		Cardiac R-wave detector LEWIS-10394	B68-10144	01
MSC-11447	B68-10220	01	Plantanandianant tananatti i ta		
Locating **sneak paths** in electr	ical		Electrocardiograph transmitted by leading telephone links in emergency site		
circuitry M-FS-15018	B68-10565	01	FRC-10031	B68-10233	01
	DOG 10000	0.1	ELECTROCHEMICAL CELLS		
ELECTRICAL INSULATION  Conceptual apparatus for detecting nonconductive liquids	leaks of		Electrochemical cell has internal meater element GSFC-10358	resistive B68-10325	01
				···==	_

ELECTROCHEMISTRY			transmittance of optical birefring	ent	
Nondestructive method for measuring r stresses in metals, a concept	residual		networks M-FS-14267	B68-10260	02
	868-10378	03			
ELECTRODES			ELECTROMAGNETIC NOISE Operational integrator		
Method of maintaining activity of				B68-10547	01
hydrogen-sensing platinum electrode	B				
M-FS-1422	868-10049	03	ELECTROMAGNETIC PROPERTIES		
Welder analyzer			Low-cost, fast-response drive circui electromagnetic torque motors	, t lor	
	868-10242	01		B68-10386	0.1
			DI MARDAMA ANDREA C. DARTARION		
Improved fuel-cell-type hydrogen sens M-FS-14656	sor 868-10263	01	ELECTROMAGNETIC RADIATION High-voltage pulse generator develop	ed for	
		·-	wide-gap spark chambers		
High-voltage pulse generator develope	ed for		ARG-10136	B68-10283	01
wide-gap spark chambers ARG-10136	868-10283	01	Imaging slitless spectrometer for X-	-ray	
			astronomy		
Concept to convert electrical power	B68-10321	01	M-FS-14309	B68-10546	02
GSFC-10222	800-10321	01	ELECTROMAGNETIC WAVE FILTERS		
ELECTROFORMING			Digital filter suppresses effects of		
Electroformed screens with uniform ho	ole		nonstatistical noise bursts on mul	itichannel	
size LEWIS-10117	B68-10107	05	scaler digital averaging systems ARG-90143	B68-10193	06
		••			
ELECTROKINETICS Fundamental electrode kinetics			ELECTROMAGNETS Rectangular configuration improves		
	B68-10196	03	superconducting cable		
			ARG-90088	B68-10098	02
ELECTROLUMINESCENCE Improved radiographic image amplifies	1		ELECTROMECHANICAL DEVICES		
	B68-10363	02	System remotely inspects, measures,	and	
			records internal irregularities in		
ELECTROLYTES Fundamental electrode kinetics			M-FS-14545	B68-10149	01
	B68-10196	03	Random access-random release relay		
			switching matrix	200 10001	
Nondestructive method for measuring a stresses in metals, a concept	residual		M-FS-12590	B68-10301	01
	B <b>68-10378</b>	03	Conceptual apparatus for detecting	leaks of	
77			nonconductive liquids M-FS-14713	B68-10303	01
Electromotive series established for used in aerospace technology	metais		n-r5-14/15	800-10303	41
	B68-10385	03	Improved electromechanical master-s	lave	
System for measuring spatial distrib	ution of		manipulator ARG-10027	B68-10372	05
ejected droplets, a concept	arron or				
NPO-10185	B68-10402	01	ELECTROMOTIVE FORCES  Electromotive series established for	- motole	
ELECTROLYTIC CELLS			used in aerospace technology	. merara	
Lithium-tellurium bimetallic cell has	s		M-FS-18327	B68-10385	03
increased voltage ARG-10141	B68-10400	01	ELECTRON BEAM WELDING		
mo avata	200 20100		Weld microfissuring in Inconel 718		
New bimetallic EMF cell shows promise	e in		minimized by minor elements M-FS-18185	B68-10251	03
direct energy, conversion ARG-10183	B68-10415	01	W-L 2-19192	10201	vo
			Electron beam selectively seals por	ous metal	
Electrolytic silver ion cell sterili: water supply	zes		filters LEWIS-10162	B68-10331	05
	B68-10555	01	BEWID 1010E	D00 10001	••
			ELECTRON BEAMS		
ELECTROMAGNETIC ABSORPTION  Correction for losses in optical			Superconductive thin film makes con- liquid helium level sensor	ARUTRIII	
birefringent networks, a concept			LANGLEY-10289	B68-10341	01
	B68-10571	20	Plaster bar managed 112 mat	amannh	
ELECTROMAGNETIC FIELDS			Electron beam recrystallization of semiconductor materials	amor prious	
High efficiency, high frequency magn	etic		LEWIS-10443	B68-10556	02
deflection driver MSC-11597	B68-10116	01	ELECTRON DISTRIBUTION		
1100 11001	200 20220	**	Four pi-recoil proportional counter	used as	
Concept to convert electrical power GSFC-10222	B68-10321	01	neutron spectrometer ARG-10101	B68-10326	02
991 C-10262	D00-10921	0.1		200 10020	
ELECTROMAGNETIC INTERFERENCE			ELECTRON EMISSION	*	
Improved communication system for la operations center	rge		Technique increases storage capacit camera tube target	y in	
	B68-10529	01	MSC-11599	B68-10213	01
ELECTROMACUETTO MEACHDEMENT			ELECTRON IRRADIATION	•	
ELECTROMAGNETIC MEASUREMENT Alternating current electromagnetic	servo		Inverted grounding technique for el	ectron	
induction meter			beam heating		0.1
XFR-03838	B68-10100	01	LEWIS-10543	B68-10411	01
Technique developed for measuring			Electron beam recrystallization of	amorphous	

semiconductor materials LEWIS-10443	B68-10556	02	ELECTRONICS Development of Electronic Data Processing /EDP/ augmented management system	
ELECTRON MICROSCOPES			M-FS-14715 B68-10287	06
Elementary review of electron m				
techniques and correction req ARG-10062	uirements B68-10195	03	ELECTROPHYSICS	
ANG 10002	B00-10195	03	Concept to convert electrical power GSFC-10222 B68-10321	01
Stratification of centrifuged a	moeba nuclei		201 0 10010	
investigated by electron micr			ELECTROPLATING	
ARG-10161	B68-10366	04	High-emittance coatings on metal substrates LEWIS-10325 B68-10381	03
ELECTRON RADIATION			LEWIS-10325 B68-10381	Ų3
Rate constants measured for hyd			ELECTROPLETHYSMOGRAPHY	
electron reactions with pepti	des and		New electrical plethysmograph monitors	
proteins ARG-10195	B68-10424	04	cardiac output MSC-11447 B68-10220	01
HKG-10193	B00-10424	V+	M3C-11447 B00-10220	01
ELECTRONIC CONTROL			ELECTROPOLISHING	
Electronic aperture control dev	ised for		Method for removing surface-damaged layers	
solid state imaging system M-FS-12428	B68-10028	01	from nickel alloys M-FS-18151 B68-10522	03
11 10 12420	100 10020	0.1	1.19.10101	0.5
Electronic circuit provides aut			ELIMINATION	
control for liquid nitrogen t			Metabolic and toxicological effects of	
KSC-10127	B68-10061	01	water-soluble xenon compounds are studied ARG-90239 B68-10076	04
ELECTRONIC EQUIPMENT			MRG-90239 BOO-10070	04
Regulated dc-to-dc converter fe	atures low		ELONGATION	
power drain			Heat treatment procedure to increase	
GSFC-03429	B68-10017	01	ductility of degraded nickel alloy M-FS-12410 B68-10029	07
System for measuring roundness	and		M-FS-12410 B68-10029	03
concentricity of large tanks			ELUTION	
M-FS-13362	B68-10099	05	Characteristics of fluidized-packed beds	
Mulatabin madanina utab abana	1 / 1 - 4 /		ARG-10049 B68-10278	03
Multichip packaging with therma M-FS-14076	B68-10119	02	EMBRITTLEMENT	
	200 2022	V.	Susceptibility of irradiated steels to	
Electronic calorimetric compute			hydrogen embrittlement	
LEWIS-90254	B68-10138	01	ARG-10115 B68-10194	03
Standards for compatibility of	printed		High temperature alloy	
circuit and component lead ma			LEWIS-10377 B68-10253	03
M-FS-14531	B68-10310	01		
Ultrasonic temperature measurin	a douise		EMBRYOS Compound equation developed for postnatal	
LEWIS-10446	B68-10319	01	growth of birds and mammals	
•			ARG-10192 B68-10427	04
Automatic, nondestructive test	monitors		EMBREDVETTE	
in-process weld quality M-FS-14996	B68-10333	0.1	EMERGENCIES Electrocardiograph transmitted by RF and	
		~-	telephone links in emergency situations	
High resolution Ge /Li/ spectro			FRC-10031 B68-10233	01
reduces rate-dependent distor	tions at high		EMISSIVITY	
ARG-10144	B68-10420	01	Properties of optics at high temperature and	
	200 20.00	V-2	their measurement, a study	
Electronic component reliabilit	y analysis		M-FS-14696 B68-10240	02
by data reduction system	DC0 10507	0.5	T	
NPO-10243	B68-10507	05	Improved relay optical element for spectroradiometer using cryogenically	
ELECTRONIC EQUIPMENT TESTS			cooled detector	
Electronic load for testing pow	er		cooled detector MSC-11688 B68-10245	02
Electronic load for testing pow generating devices		01	MSC-11688 B68-10245	
Electronic load for testing pow	er B68-10203	01	MSC-11688 B68-10245 EMITTANCE	02 <i>3</i>
Electronic load for testing pow generating devices NPO-10350 ELECTRONIC MODULES	B68-10203	01	MSC-11688 B68-10245	
Electronic load for testing pow generating devices NPO-10350 ELECTRONIC MODULES Plastic preforms facilitate fab	B68-10203	01	MSC-11688 B68-10245  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325 B68-10381	Þ
Electronic load for testing pow generating devices NPO-10350 ELECTRONIC MODULES Plastic preforms facilitate fab of welded cordwood electronic	B68-10203 rication modules		MSC-11688 B68-10245  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325 B68-10381  EMITTERS	Þ
Electronic load for testing pow generating devices NPO-10350 ELECTRONIC MODULES Plastic preforms facilitate fab	B68-10203	01	MSC-11688 B68-10245  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325 B68-10381	Þ
Electronic load for testing pow generating devices NPO-10350  ELECTRONIC MODULES Plastic preforms facilitate fab of welded cordwood electronic LEWIS-90339  Inspection criteria ensure qual	B68-10203 rication modules B68-10063		MSC-11688 B68-10245  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325 B68-10381  EMITTERS Transistorized Marx bank pulse circuit provides voltage multiplication with nanosecond rise-time	<i>₃</i> 03
Electronic load for testing pow generating devices NPO-10350  ELECTRONIC MODULES  Plastic preforms facilitate fab of welded cordwood electronic LEWIS-90339  Inspection criteria ensure qual of parallel gap soldering	B68-10203 rication modules B68-10063 ity control	01	MSC-11688 B68-10245  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325 B68-10381  EMITTERS Transistorized Marx bank pulse circuit provides voltage multiplication with	Þ
Electronic load for testing pow generating devices NPO-10350  ELECTRONIC MODULES Plastic preforms facilitate fab of welded cordwood electronic LEWIS-90339  Inspection criteria ensure qual	B68-10203 rication modules B68-10063		MSC-11688 B68-10245  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325 B68-10381  EMITTERS Transistorized Marx bank pulse circuit provides voltage multiplication with nanosecond rise-time ARG-10110 B68-10328	<i>₃</i> 03
Electronic load for testing pow generating devices NPO-10350  ELECTRONIC MODULES  Plastic preforms facilitate fab of welded cordwood electronic LEWIS-90339  Inspection criteria ensure qual of parallel gap soldering	B68-10203 rication modules B68-10063 ity control B68-10257	01	MSC-11688 B68-10245  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325 B68-10381  EMITTERS Transistorized Marx bank pulse circuit provides voltage multiplication with nanosecond rise-time	<i>₃</i> 03
Electronic load for testing pow generating devices NPO-10350  ELECTRONIC MODULES Plastic preforms facilitate fab of welded cordwood electronic LEWIS-90339  Inspection criteria ensure qual of parallel gap soldering M-FS-14530  Encapsulation technique elimina stresses in welded electronic	B68-10203 rication modules B68-10063 ity control B68-10257 tes thermal	01	MSC-11688  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325  EMITTERS Transistorized Marx bank pulse circuit provides voltage multiplication with nanosecond rise-time ARG-10110  ENCAPSULATING Encapsulation technique eliminates thermal stresses in welded electronic modules	03
Electronic load for testing pow generating devices NPO-10350  ELECTRONIC MODULES  Plastic preforms facilitate fab of welded cordwood electronic LEWIS-90339  Inspection criteria ensure qual of parallel gap soldering M-FS-14530  Encapsulation technique elimina	B68-10203 rication modules B68-10063 ity control B68-10257	01	MSC-11688  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325  EMITTERS Transistorized Marx bank pulse circuit provides voltage multiplication with nanosecond rise-time ARG-10110  ENCAPSULATING Encapsulation technique eliminates thermal	<i>₃</i> 03
Electronic load for testing pow generating devices NPO-10350  ELECTRONIC MODULES Plastic preforms facilitate fab of welded cordwood electronic LEWIS-90339  Inspection criteria ensure qual of parallel gap soldering M-FS-14530  Encapsulation technique elimina stresses in welded electronic	B68-10203 rication modules B68-10063 ity control B68-10257 tes thermal	01	MSC-11688  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325  EMITTERS Transistorized Marx bank pulse circuit provides voltage multiplication with nanosecond rise-time ARG-10110  ENCAPSULATING Encapsulation technique eliminates thermal stresses in welded electronic modules	03
Electronic load for testing pow generating devices NPO-10350  ELECTRONIC MODULES  Plastic preforms facilitate fab of welded cordwood electronic LEWIS-90339  Inspection criteria ensure qual of parallel gap soldering M-FS-14530  Encapsulation technique elimina stresses in welded electronic M-FS-14581  ELECTRONIC PACKAGING Method of disjoining adhesively	B68-10203  rication modules B68-10063  ity control B68-10257  tes thermal modules B68-10307	01	MSC-11688  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325  EMITTERS Transistorized Marx bank pulse circuit provides voltage multiplication with nanosecond rise-time ARG-10110  ENCAPSULATING Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  ENDOTHERMIC REACTIONS Electrochemical cell has internal resistive	03
Electronic load for testing pow generating devices NPO-10350  ELECTRONIC MODULES  Plastic preforms facilitate fab of welded cordwood electronic LEWIS-90339  Inspection criteria ensure qual of parallel gap soldering M-FS-14530  Encapsulation technique elimina stresses in welded electronic M-FS-14581  ELECTRONIC PACKAGING Method of disjoining adhesively electronic cordwood modules	B68-10203  rication modules B68-10063  ity control B68-10257  tes thermal modules B68-10307	01 05	MSC-11688  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325  EMITTERS Transistorized Marx bank pulse circuit provides voltage multiplication with nanosecond rise-time ARG-10110  ENCAPSULATING Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  ENDOTHERMIC REACTIONS Electrochemical cell has internal resistive heater element	03 01 01
Electronic load for testing pow generating devices NPO-10350  ELECTRONIC MODULES  Plastic preforms facilitate fab of welded cordwood electronic LEWIS-90339  Inspection criteria ensure qual of parallel gap soldering M-FS-14530  Encapsulation technique elimina stresses in welded electronic M-FS-14581  ELECTRONIC PACKAGING Method of disjoining adhesively	B68-10203  rication modules B68-10063  ity control B68-10257  tes thermal modules B68-10307	01	MSC-11688  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325  EMITTERS Transistorized Marx bank pulse circuit provides voltage multiplication with nanosecond rise-time ARG-10110  ENCAPSULATING Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  ENDOTHERMIC REACTIONS Electrochemical cell has internal resistive	03
Electronic load for testing pow generating devices NPO-10350  ELECTRONIC MODULES  Plastic preforms facilitate fab of welded cordwood electronic LEWIS-90339  Inspection criteria ensure qual of parallel gap soldering M-FS-14530  Encapsulation technique elimina stresses in welded electronic M-FS-14581  ELECTRONIC PACKAGING  Method of disjoining adhesively electronic cordwood modules MSC-12060  Multichip packaging with therma	B68-10203  rication modules B68-10063  ity control B68-10257  tes thermal modules B68-10307  bonded B68-10086	01 05	MSC-11688  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325  EMITTERS Transistorized Marx bank pulse circuit provides voltage multiplication with nanosecond rise-time ARG-10110  ENCAPSULATING Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  ENDOTHERMIC REACTIONS Electrochemical cell has internal resistive heater element	03 01 01
Electronic load for testing pow generating devices NPO-10350  ELECTRONIC MODULES  Plastic preforms facilitate fab of welded cordwood electronic LEWIS-90339  Inspection criteria ensure qual of parallel gap soldering M-FS-14530  Encapsulation technique elimina stresses in welded electronic M-FS-14581  ELECTRONIC PACKAGING  Method of disjoining adhesively electronic cordwood modules MSC-12060	B68-10203  rication modules B68-10063  ity control B68-10257  tes thermal modules B68-10307  bonded B68-10086	01 05	MSC-11688  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325  EMITTERS Transistorized Marx bank pulse circuit provides voltage multiplication with nanosecond rise-time ARG-10110  ENCAPSULATING Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  ENDOTHERMIC REACTIONS Electrochemical cell has internal resistive heater element GSFC-10358  ENERGY Welder analyzer	03 01 01
Electronic load for testing pow generating devices NPO-10350  ELECTRONIC MODULES  Plastic preforms facilitate fab of welded cordwood electronic LEWIS-90339  Inspection criteria ensure qual of parallel gap soldering M-FS-14530  Encapsulation technique elimina stresses in welded electronic M-FS-14581  ELECTRONIC PACKAGING  Method of disjoining adhesively electronic cordwood modules MSC-12060  Multichip packaging with therma	B68-10203  rication modules B68-10063  ity control B68-10257  tes thermal modules B68-10307  bonded B68-10086	01 05 01	MSC-11688  EMITTANCE High-emittance coatings on metal substrates LEWIS-10325  EMITTERS Transistorized Marx bank pulse circuit provides voltage multiplication with nanosecond rise-time ARG-10110  ENCAPSULATING Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  ENDOTHERMIC REACTIONS Electrochemical cell has internal resistive heater element GSFC-10358  ENERGY	03 01 01

ENERGY CONVERSION  New binetallic EMF cell shows promi	ise in		continuous picture of tubing joint LEWIS-10382 B68-10343	05
direct energy conversion ARG-10183	B68-10415	01	ENVIRONMENT SIMULATORS  Heat-load simulator for heat sink design	
ENERGY DISSIPATION System measures are energy dissipat	ted in		MSC-15170 B68-10510	02
relay contact cycling M-FS-14541	B68-10312	01	ENVIRONMENTAL INDEX Experimental study and evaluation of radioprotective drugs	
Four pi-recoil proportional counter neutron spectrometer ARG-10101	B68-10326	02	ARG-10196 B68-10320 ENVIRONMENTAL TESTS	04
Radial inflow turbine design charts	3		Automatic calibration system for pressure transducers	
LEWIS-10720	B68-10567	05	M-FS-20127 B68-10412	01
ENERGY LEVELS  Low energy ohmmeter can be used to sensitive circuits, other meters SAN-10013	test B68-10269	01	Environmental test planning, selection and standardization aids available SAN-10028 B68-10445	06
ENERGY SOURCES			Dual-purpose chamber-cooling system NPO-10467 B68-10506	02
Fluidic-thermochromic display device ERC-10031	B68-10350	01	Evaluation of a fluorocarbon plastic used in cryogenic valve seals	
ENERGY TRANSFER Advances in light-gas gun technolog M-FS-14270	ду В68-10288	05	M-FS-18189 B68-10523 ENVIRONMENTS	03
Feasibility study of wireless power transmission systems			Conceptual hermetically sealed elbow actuator M-FS-14710 B68-10300	<b>Q</b> 5
M-FS-14691  Axisymmetric two-phase perfect gas performance program	B68-10309	01	ENZYME ACTIVITY Study of behavior of sterols at interfaces ARG-10085 B68-10281	03
MSC-11774	B68-10374	06	The preparation, identification and	
ENGINE DESIGN Continuous detonation reaction eng M-FS-14019	ine B68-10034	03	properties of chlorophyll derivatives ARG-10205 B68-10409	03
Radial inflow turbine design chart LEWIS-10720	B68-10567	05	EPITAXY Improved process for epitaxial deposition of silicon on prediffused substrates M-FS-14910 B68-10390	03
ENGINE PARTS Cooled miniature pressure transduc	ers		EPOXY COMPOUNDS	
effective at high temperatures LEWIS-10401	B68-10370	01	Standards for compatibility of printed circuit and component lead materials M-FS-14531 B68-10310	01
Nondestructive testing of brazed rengine components			Electron beam selectively seals porous metal	
M-FS-18191	B68-10394	03	filters LEWIS-10162 B68-10331	05
ENGINEERING DRAWINGS Photographic and drafting techniqu simplify method of producing eng drawings	es ineering		Cooled miniature pressure transducers effective at high temperatures LEWIS-10401 B68~10370	01
MSC-716	B68-10128	02	EPOXY RESINS	•
ENGINES Cooled miniature pressure transduc	ers	÷	Cure of epoxy resins determined by simple tests	03
effective at high temperatures LEWIS-10401	B68-10370	01	M-PS-13131 B68-10043  Method for reinforcing tubing joints	0.5
ENTHALPY Real fluid properties of normal an	d		MSC-11108 B68-10115	05
parahydrogen LEWIS-10458	B68-10361	06	Miniature pressure transducer for stressed member application MSC-11869 B68-10246	01
The thermodynamic properties of th phase are studied	e wustite		MSC-11869 B68-10246  Encapsulation technique eliminates thermal	01
ARG-10200	B68-10408	03	stresses in welded electronic modules M-FS-14581 B68-10307	01
A mass flux probe for measurement supersonic stream LEWIS-10695	B68-10533	02	Fiberglass-reinforced structural materials for aerospace application M-FS-14806 B68-10360	03
ENTROPY Real fluid properties of normal an	d		Pressure-sensitive bonded junction	
parahydrogen LEWIS-10458	B68-10361	06	transducers ERC-10087 B68-10563	01
The thermodynamic properties of th phase are studied ARG-10200	e wustite B68-10408	03	EQUATIONS OF MOTION HICOV /Newton-Raphson calculus of variation with automatic transversalities/ M-FS-14468 B68-10232	
ENVELOPES X-ray film holder permits single			Acoustic wave analysis	

M-FS-18076	B68-10265	02	Hydrogen peroxide etching proves use	eful for	
Vibration testing and dynamic studio	es of		germanium ARG-1017.0	B68-10454 0	3
relays· M-FS-14542	B68-10268	01	Integrated metal transistor leads		
EQUATIONS OF STATE	7		GSFC-90536		)1
Real fluid properties of normal and parahydrogen			Method for removing surface-damaged from nickel alloys	-	
LEWIS-10458	B68-10361	06	M-FS-18151	B68-10522 0	)3
EQUILIBRIUM Evaluation of superconducting magnestudy M-FS-14808	ts, a B68-10396	02	ETHYL ALCOHOL  Coolants with selective optical filt characteristics for ruby laser app M-FS-20188	plications	)2
EQUIPMENT			EULER-LAGRANGE EQUATION		
Isotopically pure magnesium isotope- prepared from magnesium-24 oxide ARG-10154	-24 is B68-10293	02	Generalized Newton-Raphson trajector optimization-generator 1 M-FS-15020	•	)6
EQUIVALENT CIRCUITS			EVACUATING (VACUUM)		
GERT EXCLUSIVE-OR combining paths an loops of electrical networks			Thermal conductivity and dielectric of silicate materials		
ERC-10206	B68-10435	06	M-FS-14856	B68-10351 0	3
EROSION Two-fluid, impinging-sheet injector NPO-10547	B68-10338	05	EVALUATION  Cure of epoxy resins determined by simple tests  M-FS-13131	B68-10043 0	3
Design concept for nonarcing electric connector	ical			DOC 10040 0	
M-FS-14937	B68-10404	01	FORTRAN optical lens design program NPO-10603	B68-10354 0	6
ERROR ANALYSIS Study of optimum discrete estimators	o in		Automatic calibration system for pre transducers	essure	
measurement analysis M-FS-14915	B68-10348	02	M-FS-20127	B68-10412 0	1
ERROR CORRECTING DEVICES	D00-10040	02	EVAPORATION		
Self-correcting, synchronizing ring	counter		Improved process for making thin-fil niobate capacitors		
using integrated circuit devices M-FS-13901	B68-10067	01	MSC-11231	B68-10163 0	1
Simultaneous message framing and era			Graphite cloth facilitates vacuum evaporation of silicon monoxide M-FS-14764	B68-10256 0	3
MSC-12001	B68-10330	01	Effects of surface preparation on qu	uality	
ERROR DETECTION CODES Simultaneous message framing and error detection	ror		of aluminum alloy weldments M-FS-13152	B68-10302 0	3
MSC-12001	B68-10330	01	Superconductive thin film makes conv liquid helium level sensor	<i>j</i> enient	
ERROR FUNCTIONS FORTRAN optical lens design program			LANGLEY-10289	B68-10341 0	1
NPO-10603 ERROR SIGNALS	B68-10354	06	Electron beam recrystallization of a semiconductor materials	•	
Dynamic linearity measurement techni			LEWIS-10443	B68-10556 0	2
KSC-10186  Automatic system nondestructively m	B68-10290	01	EVAPORATIVE COOLING  Dual-purpose chamber-cooling system NPO-10467		2
and records fatigue crack growth LANGLEY-10091	B68-10379	01		DOG 10000 0	-
Accurate digital technique simulate:		01	EXCITATION  Electronic gating circuit and ultrav  laser excitation permit improved of	dominaton	
control system M-FS-14787	B68-10569	02	sensitivity ARG-10109		∂2
ERRORS	B00 10003	02	Silicon strain sensors enable pressu		-
Miniature pressure transducer for s member application			measurement at cryogenic temperatu M-FS-14703	ures	)1
MSC-11869	B68-10246	01	EXHAUST GASES		
Computer graphics data conditioning M-FS-14695	B68-10296	06	Axisymmetric two-phase perfect gas performance program MSC-11774		)6
ETCHING  Reaction rates of graphite with ozon	ne		One-dimensional reacting gas nonequi		J
measured by etch decoration  ARG-10086	B68-10101	03	one—aimensional reacting gas nonequi performance program MSC-11777		)6
Analytical techniques for determining			One-dimensional two-phase reacting of	4	J
in graphite ARG-10087	B68-10102	03	nonequilibrium performance program MSC-11780	m	)6
Standards for compatibility of prin-		••			J
circuit and component lead materia M-FS-14531		01	Axisymmetric reacting gas nonequilib performance program MSC-11781		)6

EXHAUST SYSTEMS Axisymmetric reacting gas nonequili	brium		for vanadium-20 w/o titanium /TV-2 ARG-10148	0/ B68-10368	03
performance program MSC-11781	B68-10377	06	Conditioning flat conductors for fla conductor cable production		
EXPANDABLE STRUCTURES One-dimensional reacting gas nonequ	ilibrium	,	M-FS-14914	B68-10429	01
performance program MSC-11777	B68-10375	06	Low cost techniques for fabricating bearings	lobed	
	200 200.0	•		B68-10441	05
EXPANSION  Bimetal sensor averages temperature nonuniform profile	of		Integrated metal transistor leads GSFC-90536	B68-10518	01
LEWIS-10362	B68-10007	01	Design eliminates radial thermal exp	ansion	
Encapsulation technique eliminates stresses in welded electronic mod	thermal		in turbine stator components	B68-10531	05
M-FS-14581	B68-10307	01			
EXPLODING WIRES Rapid-response, light-exposure cont	rol		Simulated hailstone fabrication and testing weatherability of structur NPO-10783		03
system NPO-10238	B68-10502	01	FABRICS		
EXPLOSIONS			Graphite cloth facilitates vacuum evaporation of silicon monoxide		
Blast deflector traps smoke and deb	ris from			B68-10256	03
explosive trains MSC-11241	B68-10105	03	FACSIMILE COMMUNICATION Facsimile video enhancement device		
EXPLOSIVE FORMING Laminated sheet composites reinforc	ed with		GSFC-10185	B68-10207	01
modular filament sheet M-FS-14575	B68-10146	03	FAILURE Application of a truncated normal fa	ilure	
		00	distribution in reliability testin	ng	02
Tube swaging device uses explosive LANGLEY-10092	force B68-10235	05		B68-10179	02
EXPONENTIAL FUNCTIONS			New method for critical failure pred of complex systems	liction	
Synthesis of electro-optic modulato amplitude modulation of light	rs for		M-FS-14133	B68-10252	02
M-FS-14268	B68-10275	20	A rapid stress-corrosion test for al alloys	uminum	
EXPOSURE Simulated hailstone fabrication and	ugo in			B68-10536	03
testing weatherability of structu		03	Failure rates for accelerated accept testing of silicon transistors	ance	
NPO-10783	P00-10227	US	ERC-10198	B68-10541	01
EXTENSOMETERS Temperature controlled strain gaged			FAST NEUTRONS		
extensometer LEWIS-10353	B68-10543	01	Procedure developed for reporting fast-neutron exposure ARG-10035	B68-10190	02
EXTRAPOLATION	+		FASTENERS		
Failure rates for accelerated acceptesting of silicon transistors			Versatile impact hand tool	D.C.O. 1.0221	0.5
ERC-10198	B68-10541	01	M-FS-20140	B68-10371	05
EXTRUDING Fabrication techniques developed fo diameter, thin-wall tungsten and			FATIGUE (MATERIALS)  Simple test for physical stability of cryogenic tank insulation	of	
alloy tubing ARG-10100	B68-10284	05	M-FS-12547	B68-10048	03
	200 10204	00	FATIGUE TESTS		
EYE (ANATOMY) Infrared viewing permits human iris response studies	:		High-temperature bearing lubricants LEWIS-10408	B68-10249	05
ERC-10003	B68-10206	04	Automatic system nondestructively mo	onitors	
EYE PROTECTION  Thermal protective visor for enteri	ng		and records fatigue crack growth LANGLEY-10091	B68-10379	01
high temperature areas MSC-10285	B68-10277	05	Effects of high frequency current in aluminum alloy 6061	n welding	
_	200 2021.		M-FS-18337	B68-10383	05
F			FEED SYSTEMS		
FABRICATION Fabrication techniques developed for diameter, thin-wall tungsten and			Dual wire weld feed proportioner M-FS-18037	B68-10332	05
alloy tubing ARG-10100	B68-10284	05	FEEDBACK Compensation circuit improves operation	tion of	
Venturi meter with separable diffus			inductive coupling transformers M-FS-138,01	B68-10129	01
LEWIS-10483	B68-10295	05	FEEDBACK AMPLIFIERS	•	
Fiberglass-reinforced structural ma for aerospace application	aterials		Improved compensation circuit for direct-coupled amplifiers		
M-FS-14806	B68-10360	03	MSC-11148	B68-10133	01
Consolidation and fabrication techn	niques				

*,* 

FEEDBACK CIRCUITS			M-FS-14652 B	68-10261 05	j
Analysis and design of a class-D a M-FS-14803	B68-10313	01	Hydrostatic testing of porous assembl M-FS-18298 B	ies 168-10439 05	5
Method for reducing snap in magnet amplifiers	ic		FINITE DIFFERENCE THEORY		
LEWIS-10388	B68-10388	01	Computer program analyzes Buckling Of		
FEEDBACK CONTROL Automatic, nondestructive test mon	itors		Shells Of Revolution with various w construction, BOSOR LANGLEY-10290 B	068-10226 06	:
in-process weld quality	•		_		
M-FS-14996	B68-10333	01	FINS Solving nonlinear heat transfer const.	ant	
Temperature or pressure controller LEWIS-10297	B68-10337	01	area fin problems M-FS-14851 B	68-10504 02	,
		••		00 10004 02	
Low-cost, fast-response drive circ electromagnetic torque motors	uit for		FIRE EXTINGUISHERS  Fire retardant foams developed to sup	press	
LEWIS-10143	B68-10386	01	fuel fires ARC-10098 B	68-10358 03	<b>.</b>
FERROMAGNETIC MATERIALS Cobalt-tungsten, ferromagnetic			FIRE PREVENTION		
high-temperature alloy	760 4666		Saran film is fire-retardant in oxyge	:n	
LEWIS-10378	B68-10095	03	atmosphere MSC-11604 B	68-10177 03	;
FIBER STRENGTH Tungsten fiber-reinforced nickel s	uperallov		Ambient temperature catalyst for hydr	ogen	
LEWIS-10424	B68-10369	03	ignition	•	
FIBERS			LEWIS-10551 B	68-10520 03	)
Laminated sheet composites reinfor modular filament sheet	ced with		FIRING (IGNITING)  Preparation of silver-activated zinc	gulfide	
M-FS-14575	B68-10146	03	thin films		,
FIELD COILS			_	68-10271 03	
Concept to convert electrical powe GSFC-10222	B68-10321	01	FISSION  Portable, high intensity isotopic neu	tron	
FIELD EFFECT TRANSISTORS			source provides increased experiment	tal	
High resolution Ge /Li/ spectromet				68-10243 02	;
reduces rate-dependent distortio	_		FISSION PRODUCTS		
ARG-10144	B68-10420	01	Low scatter lightweight fission spect constructed for biological research		
FIGURE OF MERIT FORTRAN optical lens design progra	m ·			68-10174 02	
NPD-10603	B68-10354	06	FITTINGS		
FILAMENT WINDING			Determining gas leakage from bubble formations		
Solid state high-voltage pulser op with low supply voltage	erates		M-FS-14841 Be	68-10393 05	
MFS-14034	B68-10308	01	Hand-tightened, high-pressure seal M-FS-18416 Be	68-10417 05	
Analysis of filament reinforced me pressure vessels	tal-shell			00 1041, 00	
LEWIS-10352	B68-10405	06	FIXTURES Fixture facilitates soldering operation		
FILAMENTS			M-FS-14456 BG	68-10573 05	
Application of the solid lubricant molybdenum disulfide by sputteri			FLAMMABILITY Thermal protective visor for entering		
LEWIS-10544	B68-10340	03	high temperature areas		
Fiberglass-reinforced structural m	aterials			68-10277 05	
for aerospace application M-FS-14806	B68-10360	03	FLAMMABLE GASES  Design concept for nonarcing electric:	al	
FILMS			connector	68-10404 01	¥.
Application of the solid lubricant molybdenum disulfide by sputteri				00 10404 01	
LEWIS-10544	ng B68-10340	03	FLANGES Asbestos and Inconel combined to form	hot-gas	
FILTERS			seal M-FS-14004 Be	68-10162 05	
Vacuum probe sampler removes micro particles from surfaces	n-sized		Shock-absorbing caster wheel is simple	a and	
SAN-10003	B68-10231	04	compact		
Optimetric system facilitates colo	rimetric			68-10266 05	
and fluorometric measurements NPO-10233	B68-10316	01	Electron beam selectively seals porous filters	s metal	
Laser Doppler gas-velocity instrum	ent		LEWIS-10162 Be	68-10331 05	
M-FS-20039	B68-10349	02	Determining gas leakage from bubble		
FILTRATION			formations M-FS-14841 Be	68-10393 05	
Electrocardiograph transmitted by telephone links in emergency sit			FLARED BODIES		
FRC-10031	B68-10233	01	Flare angles measured with ball gage M-FS-14690	68-10030 01	
Dynamic-reservoir lubricating devi	ce			10000 01	

FLASHING (VAPORIZING)			Fluorescent particles enable visuali	zation	
Improved process for making thin-fi niobate capacitors	lm sodium		of gas flow M∸FS-14583	B68-10259	02
MSC-11231	B68-10163	01			
FLAT PLATES			FLOW MEASUREMENT Low friction servo valve		
Acoustic wave analysis			LEWIS-10574	B68-10440	05
M-FS-18076	B68-10265	02		_	
FLEXIBILITY		,,	A mass flux probe for measurement in supersonic stream	ια	
Toggle operated double latch			LEWIS-10695	B68-10533	20
MSC-11377	B68-10117	05	FLOW REGULATORS		
Encapsulation technique eliminates	thermal		Dynamically stable check valve conce	≥pt for	
stresses in welded electronic mod	lules B68-10307	01	wide flow range M~FS-14579	B68-10247	05
M-FS-14581	B00-10307	01	N-L 2-14012	14201 000	00
Improved electromechanical master-s	lave		Dynamic-reservoir lubricating device		o E
manipulator ARG-10027	B68-10372	05	M-FS-14652	B68-10261	05
			FLOW VELOCITY	_	
FLEXIBLE BODIES Suspended chains damp wind-induced			Dynamic-reservoir lubricating device M-FS-14652	e B68-10261	05
oscillations of tall flexible str					
LANGLEY-10193	B68-10042	05	Two-fluid, impinging-sheet injector NPO-10547	B68-10338	05
Conceptual hermetically sealed elbo	w .				•
actuator M—FS—14710	B68-10300	05	Cooled miniature pressure transduce effective at high temperatures	rs	
M-1-2-14/10	B00-10300	US	LEWIS-10401	B68-10370	01
FLIGHT ALTITUDE			DI CU UZGUAL TRANTON		
Internal velocity factors MSC-15002	B68-10403	06	FLOW VISUALIZATION Fluorescent particles enable visual	ization	
			of gas flow		
FLIGHT CHARACTERISTICS  Computer graphics data conditioning	•		M-FS-14583	B68~10259	02
M-FS-14695	B68-10296	06	Computer program analyzes and design	ns	
FLIGHT CLOTHING		,	supersonic wing-body combinations ARC-10141	B68~10335	06
Biological isolation garment		,		200 10000	•
MSC-12206	B68-10500	04	FLOWMETERS	mation of	
FLIGHT CONTROL			High-pressure gas facilitates calib turbine flowmeters for liquid hyd		
Accurate digital technique simulate	es flight		LEWIS-10402	B68~10145	01
control system M-FS-14787	B68-10569	02	FLUID AMPLIFIERS		
			Fluidic transducer gives pressure o	utput as	
FLIGHT INSTRUMENTS Alternating current electromagnetic	servo		function of temperature ERC-10093	B68-10537	05
induction meter					
XFR-03838	B68-10100	01	Fluidic analog amplifier ERC-10102	B68-10538	05
FLIGHT PATHS				200 2000	
Internal velocity factors MSC-15002	B68-10403	06	FLUID DYNAMICS  Real fluid properties of normal and		
	DOG10403	00	parahydrogen		
FLIGHT SIMULATION			LEWIS-10458	B68-10361	06
Accurate digital technique simulate control system	es iligat		Acceleration insensitive fluid expa	nsion	
M-FS-14787	B68-10569	02	compensator		01
FLIP-FLOPS			ERC-10152	B68-10559	01
Self-correcting, synchronizing ring			FLUID FILTERS		
using integrated circuit devices M-FS-13901	B68-10067	01	Electron beam selectively seals por filters	ous metal	
		-	LEWIS-10162	B68-10331	05
Parallel-to-serial biphase-data com MSC-11600	nverter B68-10241	01	Hydrostatic testing of porous assem	hlies	
N30 11000	10241	01	M-FS-18298	B68-10439	05
Fluidic-thermochromic display device ERC-10031	ce B68-10350	01	FLUID FLOW		
ERC-10031	B00-10350	01	Flow tube used to cool solar-pumped		
Closed circuit TV system automatic	ally		laser	BC0 10010	0.2
guides welding arc M-FS-20084	B68-10357	01	MSC-11026	B68-10010	02
	200 27-71		Dual rate pressure relief valve		
FLOTATION  Proposed gas generation assembly we	ould		MSC-11606	B68-10237	05
recover deeply submerged objects			Fluorescent particles enable visual	ization	
SAN-10007	B68-10211	05	of gas flow M-FS-14583	B68-10259	02
FLOW DISTRIBUTION			LI_L D_T4000	DOG-10203	02
Large-amplitude inviscid fluid mot	ion in an		Dynamic-reservoir lubricating devic		05
accelerating container MSC-11560	B68-10170	02	M-FS-14652	B68-10261	
			Concept to convert electrical power		
Dynamically stable check valve con- wide flow range	cept for		GSFC-10222	B68-10321	01
M-FS-14579	B68-10247	05	Electron beam selectively seals por	ous metal	

3

FLUID INJECTION SUBJECT INDEX

filters LEWIS-10162	B68-10331	05	for 50-5000 rad range ARG-10173	B68-10426	02
Analysis of annular combustors LEWIS-10399	B68-10356	06	FLUORIDES Characteristics of fluidized-packed ARG-10049	beds B68-10278	03
Low friction servo valve LEWIS-10574	B68-10440	05	FLUORINATION Characteristics of fluidized-packed		
Computer program TRACK performs tr and/or steady state thermal anal coupled fluid flow and heat cond	ysis with		ARG-10049 FLUORINE	B68-10278	03
NU C-10189	B68-10450	06	One-dimensional reacting gas nonequi performance program		
Fluidic analog amplifier ERC-10102	B68-10538	05	MSC-11777	B68-10375	06
FLUID INJECTION Two-fluid, impinging-sheet injecto NPO-10547	r B68-10338	05	One-dimensional two-phase reacting of nonequilibrium performance program MSC-11780		06
FLUID JETS			Axisymmetric reacting gas nonequilite performance program	orium	
Fluid power-transmitting gas bearing ERC-10097	ng B68-10503	05	MSC-11781 FLUOROCARBONS	B68-10377	06
FLUID MECHANICS Acoustic wave analysis M-FS-18076	B68-10265	02	High-temperature bearing lubricants LEWIS-10408	B68-10249	05
-		02	Evaluation of a fluorocarbon plastic in cryogenic valve seals	c used	
Axisymmetric reacting gas nonequil performance program			M-FS-18189	B68-10523	03
MSC-11781  An investigation of particle mixing	B68-10377 g in a	06	FLUTTER ANALYSIS Analysis of flutter in tape transpor	rt	
gas-fluidized bed ARG-10182	B68-10407	05	systems M-FS-11970	B68-10027	01
A mass flux probe for measurement	in a		FLUX (RATE)		
supersonic stream LEWIS-10695	B68-10533	02	Low scatter lightweight fission spec constructed for biological research ARG-10094		02
Combination probe for airflow meas LEWIS-10281	urements B68-10558	01	Portable, high intensity isotopic no source provides increased experime		
FLUID POWER Fluid power-transmitting gas beari ERC-10097	ng B68-10503	05	accuracy ARG-90250	B68-10243	02
FLUID SWITCHING ELEMENTS			Method for reducing snap in magnetic amplifiers	•	
Fluidic-thermochromic display devi- ERC-10031	B68-10350	01	LEWIS-10388 Flux Density	B68-10388	01
FLUID TRANSMISSION LINES Synchronized circuit improves accu	700V 0F		Zinc-oxygen primary cell yields high energy density	n	
fluid transfer measurements MSC-11167	B68-10057	05	M-FS-14661	B68-10218	01
FLUIDICS			Detection sensitivities in 3-8 MeV neutron activation		
Fluidic-thermochromic display devi- ERC-10031	се В68-10350	01	ARG-10210 FDAMS	B68-10298	02
Fluid power-transmitting gas beari ERC-10097	ng B68-10503	05	Blast deflector traps smoke and deby explosive trains		03
Fluidic analog amplifier ERC-10102	B68-10538	05	MSC-11241 High-temperature bearing lubricants	B68-10105	
FLUIDIZED BED PROCESSORS Characteristics of fluidized-packe			LEWIS-10408 FOCUSING	B68-10249	08
ARG-10049  An investigation of particle mixin	B68-10278	03	Digital laser-beam deflection sensor M-FS-14785	B68-10525	01
gas-fluidized bed ARG-10182	B68-10407	05	FOOD Food products for space applications		
	DOO 10407	••	MSC-11697	B68-10324	04
FLUORESCENCE Fluorescent particles enable visua of gas flow			FORCE DISTRIBUTION  Deflection circuit monitors force of	n object	
M-FS-14583	B68-10259	20	under water NUC-10147	B68-10147	01
Optimetric system facilitates colo and fluorometric measurements NPO-10233	B68-10316	01	Computer program analyzes and design supersonic wing-body combinations ARC-10141	ns <sub>:</sub> B68-10335	06
Microprobe investigation of brittl segregates in aluminum MIG and T M-FS-14720		03	Improved electromechanical master-s		
Ceric and ferrous dosimeters show	precision		ARG-10027	B68-10372	05

FORCED VIBRATION			C	
Four pi-recoil proportional counter	used as		Symbolic reduction of block diagrams using FORMAC	J
neutron spectrometer			LEWIS-10409 B68-10	0423 06
ARG-10101	B68-10326	. 20	GERT EXCLUSIVE-OR combining paths and	
FORGING			loops of electrical networks	
Training manuals for nondestructive using magnetic particles	testing	.e	ERC-10206 B68-10	0435 06
M-FS-20187	B68-10391	03	Modified Multhopp mean camber computer	
CODE			program	
FORKS  Hoisting frame facilitates handling	of large		LANGLEY-10376 B68-10	0446 06
objects			Plume radiation program	
M-FS-16166	B68-10575	05	M-FS-13202 B68-10	0447 06
FORMING TECHNIQUES			Performance analysis of electrical circuit	ts
Magnetic forming studies			/PANE/	
M-FS-14217	B68-10186	02	M-FS-15001 B68-10	0448 06
FORMULAS (MATHEMATICS)			Single degree of freedom antenna pointing	
Thermal resistances of solder-boss/p	otting		program /ANTENA/	
compound combinations MSC-12074	B68-10157	01	NPQ-10756 B68-1	0449 06
1100 2001 1	200 10101	01	Computer program TRACK performs transient	
FORTRAN			and/or steady state thermal analysis wi	th
MOP /Matrix Operation Programs system/			coupled fluid flow and heat conduction NUC-10189 B68-10	0450 06
NPO-10429	B68-10005	06	NOT 10103	3100 00
A			A request-oriented information selection	
Computer program for calculation of gas thermodynamic data	ideai		program LEWIS-10255 B68-10	0451 06
LEWIS-10254	B68-10025	06	220120 20000	
Camputan pursuant 6an the	a		Modified Multhopp lifting surface loading	
Computer programs for thermodynamic transport properties of hydrogen	and		program LANGLEY-10375 B68-1	0452 06
NUC-10537	B68-10150	06		
WICOV /Nowton-Panhaon calculus of			Computer program for parameter	
HICOV /Newton-Raphson calculus of variation with automatic transvers	alities/		optimization ARC-10168 B68-10	0453 06
M-FS-14468	B68-10232	06		
Computer program analyzes and design			GERT simulation program for GERT network analysis	
supersonic wing-body combinations	13		ERC-10209 B68-10	0457 06
ARC-10141	B68-10335	06		
FORTRAN optical lens design program			Digital computer technique for setup and checkout of an analog computer	
NPO-10603	B68-10354	06	M-FS-13969 B68-1	0576 06
Analysis of annular combustors			FOURIER ANALYSIS	
LEWIS-10399	B68-10356	06	One-dimensional coulomb-damped wave motion	n
			in prismatic bars	
Real fluid properties of normal and parahydrogen			M-FS-14815 B68-1	0548 02
LEWIS-10458	B68-10361	06	FOURIER TRANSFORMATION	
			Improvement in recording and reading	
Axisymmetric two-phase perfect gas performance program			holograms ERC-10151 B68-1	0347 02
MSC-11774	B68-10374	06		
One-dimensional monetics are non-cui	libeine		FRACTURE STRENGTH	
One-dimensional reacting gas nonequiperformance program	11101146		Survey of fracture toughness test methods LEWIS-10379 B68-1	
MSC-11777	B68-10375	06		
One-dimensional two-phase reacting			Weld joint strength and mechanical proper in 2219-T81 aluminum alloy	ties
nonequilibrium performance program			LEWIS-10479 B68-1	0561 03
MSC-11780	B68-10376	06		
Axisymmetric reacting gas nonequilib	. m i um		FRAMING CAMERAS High-speed camera synchronization	
performance program	or ram		M-FS-18062 B68-1	0282 02
MSC-11781	B68-10377	06	TREE BURN OU	
Internal velocity factors			FREE ENERGY  The thermodynamic properties of the wusti	te
MSC-15002	B68-10403	06	phase are studied	
Amiliate as stlamant citasici di cita	.1 -6-11		ARG-10200 B68-1	0408 03
Analysis of filament reinforced meta pressure vessels	i-sneii		FREE VIBRATION	
LEWIS-10352	B68-10405	06	Shock and vibration response of multistage	e
CIRCUS Admital computer process	for		structure M-FS-14972 B68-1	0353 05
CIRCUSA digital computer program to transient analysis of electronic			U. LO-14915 B00-1	0000 UO
M-FS-15002	B68-10416	06	FREQUENCIES	
Computer program for machine design	of		Amplitude and frequency readout overlay GSFC-10183 B68-1	0054 01
Cassegrain feed systems	~*			VI
NPO-10588	B68-10421	06	FREQUENCY ANALYZERS	
Generalized Newton-Raphson trajector	·v		Computer program performs frequency analysis of nonuniform turbine disk	
optimization-generator 1			subjected to temperature gradients	
M-FS-15020	B68-10422	06	NUC-10301 B68-1	0006 06

Dynamic linearity measurement technique KSC-10186 B68-10290	01	potentiometer life ARC-10060 B68-10	175 01
Cryogenic liquid level measuring probe ARG-10138 B68-10291	01	Dynamic-reservoir lubricating device M-FS-14652 B68-10	261 05
FREQUENCY CONTROL Phase-lock loop frequency control and the		FROZEN EQUILIBRIUM FLOW One-dimensional reacting gas nonequilibriu	ım
dropout problem M-FS-13948 B68-10130	01	performance program MSC-11777 B68-10	375 06
Communication system features dual mode range acquisition plus time delay measurement		One-dimensional two-phase reacting gas nonequilibrium performance program MSC-11780 B68-10	376 06
M-FS-14323 B68-10306	01	Axisymmetric reacting gas nonequilibrium	
FREQUENCY CONVERTERS Regulated dc-to-dc converter features low		performance program MSC-11781 B68-10	377 06
power drain GSFC-03429 B68-10017	01	FUEL CELLS Improved fuel-cell-type hydrogen sensor	
Automatic patient respiration failure detection system with wireless transmission ARC-10174 B68-10365	01	M-FS-14656 B68-10 FUEL COMBUSTION	0263 01
System converts optical phase changes to RF phase changes		Fire retardant foams developed to suppress fuel fires ARC-10098 B68-10	
M-FS-20091 B68-10430	01	FUEL INJECTION	
FREQUENCY DISTRIBUTION  Astronaut space suit communication antenna  MSC-12101 B68-10238	01	Two-fluid, impinging-sheet injector NPO-10547 B68-10	338 05
		FUEL PUMPS	
FREQUENCY DIVIDERS  Parallel-to-serial biphase-data converter  MSC-11600 B68-10241	01	Between-bearing shaft seal, a concept M-FS-18179 B68-10	0286 05
		FUEL SYSTEMS	
FREQUENCY MODULATION  Deep space FM system, a concept		Fuel transfer system permits rapid coupling	
MSC-11825 B68-10289	01	M-FS-91326 B68-10	0039 05
Dynamic linearity measurement technique KSC-10186 B68-10290	01	FUNCTION GENERATORS One-shot pulse shaper circuit XGS-11379 B68-10	0012 01
Automatic patient respiration failure detection system with wireless transmission		Synthesis of electro-optic modulators for	
ARC-10174 B68-10365	01	amplitude modulation of light M-FS-14268 B68-10	0275 02
System converts optical phase changes to RF phase changes		FUNCTIONAL ANALYSIS	
M-FS-20091 B68-10430	01	Real fluid properties of normal and parahydrogen	
FREQUENCY RANGES Analysis and design of a class-D amplifier		LEWIS-10458 B68-10	0361 06
M-FS-14803 B68-10313	01	FUNCTIONS (MATHEMATICS)  Computer program for calculation of ideal	
Power consumption in acoustic amplifiers under conditions of maximum stable gain GSFC-10067 B68-10327	01	gas thermodynamic data LEWIS-10254 B68-10	0025 06
Study of optimum discrete estimators in	01	Deep gamma ray penetration in thick shield M-FS-14388 B68-10	
measurement analysis	02		
	02	Solution of differential equations by application of transformation groups	
FREQUENCY SHIFT Laser Doppler gas-velocity instrument		M-FS-14802 B68-10	0276 02 <i>₃</i>
M-FS-20039 B68-10349	02	FDRTRAN optical lens design program NPD-10603 B68-10	
FREQUENCY STANDARDS Improved atomic resonance gas cell for use		FURNACES	
in frequency standards MSC-11666 B68-10230	01	Measuring thermal expansion of multiple specimens at high temperature	
FREQUENCY SYNTHESIZERS		NUC-10153 B68-10	0122 05
Dynamic linearity measurement technique KSC-10186 B68-10290	01	Silicon solar cell monitors high temperatu furnace operation NUC-10163 B68-10	
FRICTION Application of the solid lubricant molybdenum disulfide by sputtering		Ignition of binary alloys of uranium ARG-10057 B68-10	0280 01
LEWIS-10544 B68-10340	03	Isotopically pure magnesium isotope-24 is	
FRICTION FACTOR Stress-corrosion-induced property changes		prepared from magnesium-24 oxide ARG-10154 B68-10	0293 02
in aluminum alloys M-FS-20209 B68-10568	03	FUSES (ORDNANCE) Clamp for detonating fuze	
FRICTION REDUCTION Capacitance-coupled wiper increases		M-FS-13399 B68-10	0072 05

G			GAS DYNAMICS Advances in light-gas gun technology M-FS-14270 B	68-10288 05
GALLIUM ARSENIDE LASERS Electro-optic modulator for infrare	d laser		GAS EXPANSION	
using gallium arsenide crystal			Axisymmetric two-phase perfect gas	
GSFC-10686	B68-10255	02 ,	performance program MSC-11774 B	68-10374 06
GALLIUM PHOSPHIDES				
System measures response time of photomultiplier tubes			One-dimensional two-phase reacting ga nonequilibrium performance program	.\$
LEWIS-10437	B68-10382	01		68-10376 06
GALVANOMAGNETIC EFFECTS			GAS FLOW	
Electromotive series established for	r metals		Device provides controlled gas leaks	
used in aerospace technology M-FS-18327	B68-10385	03	NPO-10298 B	68-10142 03
	B00 10000		Dynamically stable check valve concep	t for
GALVANOMETERS Precision bolometer bridge			wide flow range M-FS-14579 B	68-10247 05
	B68-10156	01		
Nondestructive method for measuring	regidual		Fluorescent particles enable visualiz of gas flow	ation
stresses in metals, a concept				68-10259 02
KSC-10237	B68-10378	03	Laser Doppler gas-velocity instrument	•
Method for measuring alternator vol	tage			68-10349 02
transients LEWIS-10373	B68-10513	01	Precise doping of metals by small gas	flows
GAMMA FUNCTION				68-10526 03
Independent doubly truncated gamma	variables		GAS GENERATORS	
M-FS-20143	B68-10345	02	Proposed gas generation assembly woul recover deeply submerged objects	d
GAMMA RAY BEAMS				68-10211 05
Detection sensitivities in 3-8 MeV neutron activation			GAS LASERS	
ARG-10210	B68-10298	02	Improved gas ring laser	
GAMMA RAYS			MSC-11584 B	868-10304 02
Deep gamma ray penetration in thick			Repetitively pulsed, wavelength-selec	tive
M-FS-14388	B68-10143	02	carbon dioxide laser ERC-10178 B	868-10564 02
Steady-state differential calorimet				
measures gamma heating in reactor ARG-10120	B68-10182	01	GAS PRESSURE Compact monitoring and control consol	e for
Paus -:			pressurized gas bottles	
Four pi-recoil proportional counter neutron spectrometer	usea as		M-FS-14874 B	368-10401 05
ARG-10101	B68-10326	02	GAS-SOLID INTERFACES Characteristics of fluidized-packed b	oda
High resolution Ge /Li/ spectromete				368-10278 03
reduces rate-dependent distortion counting rates	s at high		GAS STREAMS	
ARG-10144	B68-10420	01	High-speed camera synchronization	
GAS BEARINGS			M-FS-18062 B	368-10282 02
Squeeze-film gas bearing technology			GAS TUNGSTEN ARC WELDING	
M-FS-14821	B68-10180	05	Dual wire weld feed proportioner M-FS-18037 B	368-10332 05
Low friction servo valve	760 10//0			
LEWIS-10574	B68-10440	05	Microprobe investigation of brittle segregates in aluminum MIG and TIG	welds
Low cost techniques for fabricating bearings	lobed		M-FS-14720 B	868-10334 03
LEWIS-10296	B68-10441	05	Effects of high frequency current in	welding
Air Bearing Lift Pad /ABLP/			aluminum alloy 6061 M-FS-18337 B	368-10383 05
M-FS-14685	B68-10442	05		
Fluid power-transmitting gas bearin	a		Weld joint strength and mechanical pr in 2219-T81 aluminum alloy	operties
ERC-10097	B68-10503	05		368-10561 03
GAS CHROMATOGRAPHY			Welding skate with computerized contr	rols
Effects of surface preparation on q	uality			368-10566 01
of aluminum alloy weldments M-FS-13152	B68-10302	03	GAS TURBINES	
GAS DISCHARGES			Analysis of annular combustors LEWIS-10399 B	368-10356 06
Two-fluid, impinging-sheet injector			FE#12-10399	100-10330 VO
NPO-10547	B68-10338	05	Dual-purpose chamber-cooling system NPO-10467	B68-10506 02
Axisymmetric two-phase perfect gas				, 00-10000 V
performance program MSC-11774	B68-10374	06	GAS WELDING Microprobe investigation of brittle	
		00	segregates in aluminum MIG and TIG	
Rapid-response, light-exposure cont system	rol		M-FS-14720 B	868-10334 03
NPO-10238	B68-10502	01		

-34

GASEOUS DIFFUSION SUBJECT INDEX

GASEOUS DIFFUSION Reducing bubbles in glass coatings i	improves		LEWIS-10443	B68-10556	20
electrical breakdown strength LEWIS-10278	B68-10214	03	GERMANIUM DIGDES High resolution Ge /Li/ spectrometer		
GASEOUS ROCKET PROPELLANTS			reduces rate-dependent distortions counting rates	s at high	
One-dimensional reacting gas nonequi performance program	ilibrium		ARG-10144	B68-10420	01
MSC-11777	B68-10375	06	GETTERS Titanium-nitrogen reaction investiga	ated for	
GASES			application to gettering systems		
Between-bearing shaft seal, a concer M-FS-18179	ot B68-10286	.05	ARG-10208	B68-10414	03
GATES (CIRCUITS)			GIMBALLESS INERTIAL NAVIGATION Improved gas ring laser		
Input gate circuit converted for use	e as		MSC-11584	B68-10304	02
linear amplifier M-FS-14265	B68-10015	01	GIMBALS		
Self-correcting, synchronizing ring	counter		Gimbal angle sensor GSFC-10305	B68-10315	01
using integrated circuit devices M-FS-13901	B68-10067	01	GLARE		
		<b>01</b>	Antiglare improvement for optical in	naging	
Electronic gating circuit and ultrav laser excitation permit improved o			systems NPO-10337	B68-10090	02
sensitivity ARG-10109	B68-10077	02	GLASS		
Parallel-to-serial biphase-data conv	ionton		Heat-shrink plastic tubing seals jo glass tubing	ints in	
MSC-11600	B68-10241	01	LEWIS-10329	B68-10040	05
High-speed camera synchronization			Glassy materials investigated for n	uclear	
M-FS-18062	B68-10282	20	reactor applications ARG-10075	B68-10103	03
Fluidic-thermochromic display device ERC-10031	B68-10350	01	Multichip packaging with thermal in:	gulation	
,	B00 10000	01	M-FS-14076	B68-10119	20
GELATINS Rate constants measured for hydrated			Manganese-alumina-ceramic glass elic	minates	
electron reactions with peptides a proteins	and		rigid controls necessary in bondi: to ceramics	ng metals	
ARG-10195	B68-10424	04	SAN-10012	B68-10204	03
GELS			Inspection criteria ensure quality of parallel gap soldering	control	
Study of behavior of sterols at into ARG-10085	B68-10281	03	M-FS-14530	B68-10257	05
GENERATION			Thermal protective visor for entering	ng	
Study of radiation effects on mamma: in vitro	lian cells		high temperature areas MSC-10285	B68-10277	05
ARG-10191	B68-10294	02	Optimetric system facilitates color		
GENETIC CODE			and fluorometric measurements		
Study of radiation effects on mamma: in vitro	lian cells		NPO-10233	B68-10316	01
ARG-10191	B68-10294	02	Indium adhesion provides quantitati measure of surface cleanliness	ve	
GEODESY Theory of a refined earth model			SAN-10024	B68-10342	01
M-FS-14679	B68-10228	02	Thermal conductivity and dielectric	constant	
GEODETIC COORDINATES			of silicate materials M-FS-14856	B68-10351	03
Theory of a refined earth model M-FS-14679	B68-10228	02	High dielectric thick films for scr	eened	
GEOLOGY			circuit capacitors LANGLEY-10294	B68-10542	013
Preparing rock powder specimens of				200 10012	
controlled size distribution NPO-10007	B68-10297	05	GLASS COATINGS Reducing bubbles in glass coatings	improves	
GEOMETRY			electrical breakdown strength LEWIS-10278	B68-10214	03
Computer program analyzes and design supersonic wing-body combinations			Glass coated single grid for charge	d	
ARC-10141	B68-10335	06	particle acceleration	B68-10215	03
Radial inflow turbine design charts			LEWIS-10106	B06-10215	. 03
LEWIS-10720	B68-10567	05	GLASS FIBERS  Molding a high-density laminate		
GERMANIUM Feasibility study of wireless power			LANGLEY-10051	B68-10092	03
transmission systems		0.1	Astronaut space suit communication MSC-12101		01
M-FS-14691	B68-10309	01		B68-10238	01
Hydrogen peroxide etching proves us germanium	eful for		Fiberglass-reinforced structural ma for aerospace application	terials	
ARG-10170	B68-10454	03	M-FS-14806	B68-10360	03
Electron beam recrystallization of semiconductor materials	amorphous		Fiberglass prevents cracking of polyurethane foam insulation on c	ruogenic	
semiconductor materials			porgarethane roam insuration on c	1 9 O S C II C	

vessels M-FS-20058	B68-10406	02	GRINDING MACHINES Preparing rock powder specimens of controlled size distribution	D60 10207 AF
GLAZES Experiments with ceramic coatings M-FS-18150	B68-10355	03	Compressible sleeve provides automat	
GLYCEROLS Radiation effects on bacterial cell			centering for grinding or turning cylinders SAN-10021	of B68-10318 05
ARG-10064	B68-10169	04	GROOVES Quick-attach clamp	
Improved fuel-cell-type hydrogen se M-FS-14656	B68-10263	01	XFR-05421  Spiral-grooved shaft seals substanti	B68-10250 05
Optimetric system facilitates color and fluorometric measurements NPO-10233	imetric B68-10316	01	reduce leakage and wear	B68-10270 05
			GROOVING	•
Improved radiographic image amplifi M-FS-14522	B68-10363	02	Shallow grooves in journal improve a bearing performance LEWIS-10396	B68-10134 05
GOLD COATINGS Inspection criteria ensure quality of parallel gap soldering			Preparing rock powder specimens of controlled size distribution	ndo 1000 <b>7</b> - 65
M-FS-14530	B68-10257	05	NPO-10007	B68-10297 05
Thermal protective visor for enter high temperature areas MSC-10285	ing B68–10277	05	GROUND EFFECT MACHINES Air Bearing Lift Pad /ABLP/ M-FS-14685	B68-10442 05
GRAIN BOUNDARIES Effects of high frequency current	in welding		GROUND SUPPORT EQUIPMENT Tube joint leak repair coupling MSC-15022	B68-10540 05
aluminum alloy 6061 M-FS-18337	B68-10383	05		000-10340 03
Grain-boundary migration in KCl bio	erystals B68-10455	03	GROUND SUPPORT SYSTEMS Assembly, checkout, and operation optimization analysis technique fo	or
GRAPHIC ARTS Projection transparencies from prin	nted		complex systems M-FS-14105	B68-10222 05
material M-FS-14608	B68-10112	01	GROWTH  Dynamics of moving bubbles in single binary component systems	and
GRAPHITE				B68-10339 02
Reaction rates of graphite with ozo measured by etch decoration ARG-10086	B68-10101	03	Compound equation developed for post growth of birds and mammals ARG-10192	natal B68-10427 04
Analytical techniques for determin	ing boron		CUIDANCE (MORTON)	
in graphite ARG-10087	B68-10102	03	GUIDANCE (MOTION)  Closed circuit TV system automatical guides welding arc	
Graphite cloth facilitates vacuum evaporation of silicon monoxide M-FS-14764	B68-10256	03	M-FS-20084 GYRATORS	B68-10357 01
			Gyrator-type circuits replace ungrou	ınded
GRAPHS (CHARTS)  Tool reconstructs data input point:	s		inductors XAC-10608	B68-10084 01
corresponding to first order out M-FS-18003	put graph B68-10154	02	GYROSCOPES Squeeze-film gas bearing technology	
Computer graphics data conditioning M-FS-14695	B68-10296	06	M-FS-14821	B68-10180 05
Solving nonlinear heat transfer co	nstant		Laser system used for dynamic balanc gyros	;ing oi
area fin problems M-FS-14851	B68-10504	02	M-FS-12218	B68-10225 05
Radial inflow turbine design/chart LEWIS-10720	s B68-10567	05	Improved gas ring laser MSC-11584	B68-10304 02
Design of dissipative linear phase	filtons		Н	
M-FS-14698	B68-10572	01	HAIL Simulated hailstone fabrication and	use in
GRAVITATION Theory of a refined earth model M-FS-14679	B68-10228	02	testing weatherability of structur NPO-10783	res B68-10552 03
GRIDS			HALL EFFECT System measures arc energy dissipate	ed in
System for measuring spatial distr ejected droplets, a concept			relay contact cycling M-FS-14541	B68-10312 01
NPO-10185	B68-10402	01	HALOGEN COMPOUNDS	,
GRINDING (MATERIAL REMOVAL)  Manual of industrial diamonds plus and grinding criteria for machin			Fire retardant foams developed to su fuel fires ARC-10098	uppress B68-10358 03
and grinding criteria for machin superalloys M-FS-14582	B68-10239	05		

HALOGENATION  Fire retardant foams developed to study fires	suppress		heats of formation of alloys at high temperatures ARG-10114 B68-10083	01
ARC-10098	B68-10358	03	One-dimensional reacting gas nonequilibrium	• • •
HAMMERS			performance program	
Versatile impact hand tool M-FS-20140	B68-10371	05	MSC-11777 B68-10375	06
HAMSTERS			HEAT OF VAPORIZATION  Cooling of 2 kW H subscript 2-0 subscript 2	
Study of radiation effects on mamma	alian cells		fuel cell	
in vitro ARG-10191	B68-10294	02	M-FS-13737 B68-10544	01
HANDBOOKS			HEAT RESISTANT ALLOYS Cobalt-tungsten, ferromagnetic	
Training manuals for nondestructive	e testing		high-temperature alloy	
using magnetic particles M-FS-20187	B68-10391	03	LEWIS-10378 B68-10095	03
Contamination control handbook			Manual of industrial diamonds plus dressing and grinding criteria for machining	
M-FS-20185	B68-10392	03	superalloys	
Failure rates for accelerated acce	ptance		M-FS-14582 B68-10239	05
testing of silicon transistors ERC-10198	B68-10541	01	Nickel base alloy with improved stress rupture properties	
	000-10041	01	LEWIS-10283 B68-10344	03
HARMONIC ANALYSIS  Harmonic distortion analyzer speed:	s setup of		Tungsten fiber-reinforced nickel superalloy	
magnetic tape recorders GSFC-10198	B68-10254	01	LEWIS-10424 B68-10369	03
	100-10294	O.I.	Nickel-base superalloy*s excellent	
HARMONIC FUNCTIONS  Large-amplitude inviscid fluid mot	ion in an		properties promote its service to 2200 degrees F	
accelerating container MSC-11560	B68-10170	02	LEWIS-10355 B68-10380	03
	100-10170	02	HEAT SINKS	
HARMONIC OSCILLATORS Synthesis of electro-optic modulate	ors for		Method of disjoining adhesively bonded electronic cordwood modules	
amplitude modulation of light M-FS-14268	B68-10275	02	MSC-12060 B68-10086	01
	B00-10273	UZ	Transistorized Marx bank pulse circuit	
HASTELLOY (TRADEMARK) Hastelloy X properties, data, and			provides voltage multiplication with nanosecond rise-time	
metallurgical characteristics NUC-10302	B68-10023	03	ARG-10110 B68-10328	01
	500-10025	03	Heat-load simulator for heat sink design	
HAZARDS  Chemistry laboratory safety manual			MSC-15170 B68-10510	02
available SAN-10030	B68-10419	03	High conductance vapor thermal switch GSFC-10109 B68-10519	02
		03		02
Ambient temperature catalyst for hy ignition	ydrogen		HEAT SOURCES  Pyrotechnic device provides one-shot	
LEWIS-10551	B68-10520	03	heat source LEWIS-10131 B68-10062	03
HEART FUNCTION				00
Cardiac R-wave detector LEWIS-10394	B68-10144	01	Electrochemical cell has internal resistive heater element	
HEAT BALANCE			.GSFC-10358 B68-10325	01
Electronic calorimetric computer			HEAT TRANSFER	
LEWIS-90254	B68-10138	01	Properties of optics at high temperature and their measurement, a study	
HEAT EXCHANGERS  Concept to comfort-condition subject	rta		M-FS-14696 B68-10240	02
wearing restrictive clothing MSC-10964			Characteristics of fluidized-packed beds	
	B68-10178	02	ARG-10049 B68-10278	03ॐ
HEAT GENERATION  Cooling of 2 kW H subscript 2-0 subscript	bscript 2		Thermal conductivity and dielectric constant of silicate materials	
fuel cell M-FS-13737	•	0.1	M-FS-14856 B68-10351	03
	B68-10544	01	Analysis of annular combustors	
HEAT MEASUREMENT  Twin solution calorimeter determing	es		LEWIS-10399 B68-10356	06
heats of formation of alloys at l temperatures			Rating of electrical wires in vacuum environments	
ARG-10114	B68-10083	01	MSC-15108 B68-10362	01
Steady-state differential calorime	ter		An investigation of particle mixing in a	
measures gamma heating in reacto: ARG-10120		01	gas-fluidized bed ARG-10182 B68-10407	05
		VI.		υĐ
A mass flux probe for measurement supersonic stream	in a		Solving nonlinear heat transfer constant area fin problems	
LEWIS-10695	B68-10533	02	M-FS-14851 B68-10504	02
HEAT OF FORMATION		•	Cooling of 2 kW H subscript 2-0 subscript 2	
Twin solution calorimeter determine	es		fuel cell	

			•		
M-FS-13737	B68-10544	01	semiconductor component packages ERC-10150	B68-10562	01
HEAT TRANSFER COEFFICIENTS Evaluation of superconducting magn	ets. a		HERMETIC SEALS		٠
study M-FS-14808	B68-10396	02	Multichannel implantable telemetry a ARC-10083	system B68-10065	01
Heat transfer coefficients for liq	uid	,	Conceptual hermetically sealed elbo	W	
hydrogen turbopumps M-FS-18345	B68-10517	02	actuator M-FS-14710	B68-10300	05
HEAT TRANSMISSION			HETERODYNING	·	
Solution of differential equations application of transformation gr	oups		Laser Doppler gas-velocity instrume M-FS-20039	nt B68–10349	ÓZ
M-FS-14802	B68-10276	02	HIGH FREQUENCIES		
Dynamics of moving bubbles in sing	le and		Moebius resistor is noninductive and	d ·	
binary component systems M-FS-14845	B68-10339	02	nonreactive SAN-10020	B68-10267	01
N-12-14040	P00-10222	02	3AN-10020	10201-000	01
Computer program TRACK performs tr	ansient		Cooled miniature pressure transduce	rs	
and/or steady state thermal anal coupled fluid flow and heat cond			effective at high temperatures LEWIS-10401	B68-10370	01
NUC-10189	B68-10450	06	PUMIN 10401	DOC 10070	01
			Effects of high frequency current is	n welding	
Solving nonlinear heat transfer co area fin problems	nstant		aluminum alloy 6061 M-FS-18337	B68-10383	05
M-FS-14851	B68-10504	02		211 21111	
UD A BODA BUDIE		•	HIGH PASS FILTERS		
HEAT TREATMENT  Heat treatment procedure to increa	90		Study of optimum discrete estimator measurement analysis	s 1N	
ductility of degraded nickel all			M-FS-14915	B68-10348	02
M-FS-12410	B68-10029	03	B	e:14	
Antechamber facilitates loading an unloading of vacuum furnace	d		Design of dissipative linear phase M-FS-14698	B68-10572	01
LEWIS-10265	B68-10135	20	HIGH PRESSURE		
Weld microfissuring in Inconel 718			Device damps fluid pressure oscilla vent valve	tions in	
minimized by minor elements			M-FS-13290	B68-10078	05
M-FS-18185	B68-10251	03			
Pre-weld heat treatment improves w	alda in		High-pressure gas facilitates calib turbine flowmeters for liquid hyd		
Rene 41	elus III		LEWIS-10402	B68-10145	01
M-FS-18174	B68-10285	03			
Improved thermal treatment of alum	i n.u.m		High-torque power wrench, a concept M-FS-18194	B68-10299	05
alloy 7075	IIIum		N 13 10134	DOO 10233	00
M-FS-20083	B68-10534	05	Hand-tightened, high-pressure seal	202 40142	
HEATERS			M-FS-18416	B68-10417	05
Lightweight heater generates high			HIGH RESISTANCE		
temperatures from low current	DG0 10005		Electro-optic modulator for infrare	d laser	
SAN-10004	B68-10223	01	using gallium arsenide crystal GSFC-10686	B68-10255	02
Viscosity and density of methanol/	water				
mixtures at low temperatures M-FS-14991	B68-10274	03	Temperature or pressure controller LEWIS-10297	B68-10337	01
M-12-14991	808-10274	03	LEW12-1029/	P09-10331	01
HEATING			HIGH SPEED		
Graphite cloth facilitates vacuum evaporation of silicon monoxide			Simplified, high-speed binary data decoder		
M-FS-14764	B68-10256	03	NPO-10118	B68-10058	01
Inverted grounding technique for e beam heating	lectron		High-speed camera synchronization M-FS-18062	B68-10282	02
LEWIS-10543	B68-10411	01	11-12 10002		02
			Communication system features dual		
HELICAL WINDINGS  Dynamically stable check valve con	cent for		range acquisition plus time delay measurement		
wide flow range	cept 101		M-FS-14323	B68-10306	01
M-FS-14579	B68-10247	05			
HELIUM			Solid state high-voltage pulser ope with low supply voltage	rates	
Reducing bubbles in glass coatings	improves		M-FS-14034	B68-10308	01
electrical breakdown strength	Dec 1001	0.3	UTCU CDCCD CAMEDAS		
LEWIS-10278	B68-10214	03	HIGH SPEED CAMERAS High-speed camera synchronization		
Quasi-static vapor pressure measur			M-FS-18062	B68-10282	02
on reactive systems in inert atm ARG-90142	osphere box B68-10236	01	High-ground bulgs serves		
NUC SVIIC	POOLIASOO	VI	High-speed pulse camera MSC-11353	B68-10329	02
Advances in light-gas gun technolo			•		
M-FS-14270	B68-10288	05	HIGH STRENGTH ALLOYS  High strength nickel-base alloy wit	· h	
Cryogenic liquid level measuring p	robe		improved oxidation resistance up		
ARG-10138	B68-10291	01	degrees F		
Reliable method for testing gross	leaks in		LEWIS-10115	B68-10094	03
	uns In				

HIGH TEMPERATURE High-temperature bearing-cage materials LEWIS-10403 B68-	10176 05		368-10343	05
Weld microfissuring in Inconel 718 minimized by minor elements		Versatile impact hand tool M-FS-20140 E	368-10371	05
M-FS-18185 B68-	10251 03	HOLE DISTRIBUTION (ELECTRONICS) Electroformed screens with uniform ho	ole	
Inverted grounding technique for electro beam heating LEWIS-10543 B68-	n ·10411 01	size LEWIS-10117 E	368-10107	05
HIGH TEMPERATURE ENVIRONMENTS	_	HOLE DISTRIBUTION (MECHANICS)  Computer program calculates and plots		
Asbestos and Inconel combined to form ho seal M-FS-14004	1-gas 10162 05	surface area and pore size distribu GSFC-10362 E		06
High temperature alloy		HOLOGRAPHY Improvement in recording and reading		
	10253 03	holograms ERC-10151 E	368-10347	02
Ultrasonic temperature measuring device LEWIS-10446 B68-	10319 01	HOSES Hand-tightened, high-pressure seal		
HIGH TEMPERATURE FLUIDS  Consolidation and fabrication techniques	ı		368-10417	05
for vanadium-20 w/o titanium /TV-20/	10368 03	HOSPITALS Electrocardiograph transmitted by RF		
HIGH TEMPERATURE LUBRICANTS High-temperature bearing lubricants		telephone links in emergency situat FRC-10031		01
	10249 05	HUMAN BEINGS Electrocardiograph transmitted by RF	and	
HIGH TEMPERATURE PLASMA Imaging slitless spectrometer for X-ray astronomy		telephone links in emergency situat	tions	01
	10546 02	HUMAN PERFORMANCE  Effect of surface irregularities on b	nellows	
HIGH TEMPERATURE RESEARCH Properties of optics at high temperature	and	fatigue life M-FS-14480 E	368-10229	05
their measurement, a study M-FS-14696 B68-	10240 02	HYDRATION Rate constants measured for hydrated		
High-temperature thermionic emission microscope		electron reactions with peptides an proteins		
	10516 01		368-10424	04
HIGH TEMPERATURE TESTS  Tensile testing grips ensure uniform loa  of bimetal tubing specimens	ding	HYDRAULIC CONTROL  Low-cost, fast-response drive circuit electromagnetic torque motors	for	
	10248 05		868-10386	01
High-temperature bearing lubricants LEWIS-10408 B68-	10249 05	HYDRAULIC EQUIPMENT Pressure variable orifice for hydraul control valve	lic	
Consolidation and fabrication techniques for vanadium-20 w/o titanium /TV-20/	i e		368-10120	05
ARG-10148 B68-	10368 03	High-torque power wrench, a concept M-FS-18194	368-10299	05
HIGH VACUUM Improved process for making thin-film so	od i um	Conceptual hermetically sealed elbow		
niobate capacitors MSC-11231 B68-	10163 01	actuator M-FS-14710	368-10300	05
High-emittance coatings on metal substra LEWIS-10325	ites 10381 03	Conceptual apparatus for detecting le nonconductive liquids	aks of	
HIGH VOLTAGES	10501 05		368-10303	01
High-voltage pulse generator developed f wide-gap spark chambers		Hand-tightened, high-pressure seal M-FS-18416	368-10417	05
	10283 01	HYDRODYNAMICS		
Solid state high-voltage pulser operates with low supply voltage M-FS-14034 B68-	· -10308 01	Spiral-grooved shaft seals substantia reduce leakage and wear LEWIS-10397	B68-10270	05
HOLDERS	10000 01	HYDROGEN	700 10270	••
Tensile testing grips ensure uniform loa of bimetal tubing specimens	ding -10248 05	Method of maintaining activity of hydrogen-sensing platinum electrode	e B68-10049	03
Application of the solid lubricant molybdenum disulfide by sputtering		Computer programs for thermodynamic a transport properties of hydrogen	and	
	-10340 03		868-10150	06
Indium adhesion provides quantitative measure of surface cleanliness SAN-10024 B68-	-10342 01	Welding of commercial base plates is investigated M-FS-13649	B68-10192	03
X-ray film holder permits single		Susceptibility of irradiated steels	to	

	hydrogen embrittlement ARG-10115	B68-10194	03	IBM 360 COMPUTER CIRCUS-A digital computer program transient analysis of electronic		
	Manganese-alumina-ceramic glass el rigid controls necessary in bond to ceramics			M-FS-15002	B68-10416	06
	SAN-10012	B68-10204	03 ,	Generalized Newton-Raphson trajector optimization-generator 1 M-FS-15020	ry B68-10422	06
	Proposed gas generation assembly w recover deeply submerged objects SAN-10007		05	Performance analysis of electrical	circuits	
	Improved fuel-cell-type hydrogen s	B68-10211 ensor	05	/PANE/ M-FS-15001	B68-10448	06
	M-FS-14656	B68-10263	01	IBM 7044 COMPUTER Analysis of annular combustors	242 4255	
	Advances in light-gas gun technolo M-FS-14270	gy B68-10288	05	LEWIS-10399  IBM 7090 COMPUTER	B68-10356	06
	Cryogenic liquid level measuring p ARG-10138	robe B68-10291	01	Computer program analyzes and design supersonic wing-body combinations ARC-10141		06
	Hydrogen safety manual LEWIS-10487	B68-10323	01	IBM 7094 COMPUTER HICOV /Newton-Raphson calculus of		
	Real fluid properties of normal an parahydrogen LEWIS-10458	d B68-10361	06	variation with automatic transver M-FS-14468	salities/ B68-10232	06
	One-dimensional reacting gas noneq		06	Computer program analyzes and designum supersonic wing-body combinations		
	performance program MSC-11777	B68-10375	06	ARC-10141	B68-10335	06
	One-dimensional two-phase reacting nonequilibrium performance progr	gas am		FORTRAN optical lens design program NPO-10603	B68-10354	06
	MSC-11780  Axisymmetric reacting gas nonequil	B68-10376	06	Analysis of annular combustors LEWIS-10399	B68-10356	06
	performance program MSC-11781	B68-10377	06	Real fluid properties of normal and parahydrogen LEWIS-10458	B68-10361	
	Ambient temperature catalyst for h ignition	ydrogen		Axisymmetric two-phase perfect gas	200 10001	•
	LEWIS-10551	B68-10520	03	performance program MSC-11774	B68-10374	06
HYI	DROGEN COMPOUNDS Fire retardant foams developed to	suppress		One-dimensional reacting gas nonequ	ilibrium	
	fuel fires ARC-10098	B68-10358	03	performance program MSC-11777	B68-10375	06
HYI	OROGEN OXYGEN FUEL CELLS  Cooling of 2 kW H subscript 2-0 su  fuel cell	bscript 2		One-dimensional two-phase reacting nonequilibrium performance programmSC-11780		06
	M-FS-13737	B68-10544	01	Axisymmetric reacting gas nonequili	brium	
HYI	OROGEN PEROXIDE Tube swaging device uses explosive LANGLEY-10092	force B68-10235	05	performance program MSC-11781	B68-10377	06
	Hydrogen peroxide etching proves u	seful for		Internal velocity factors MSC-15002	B68-10403	06
	germanium ARG-10170	B68-10454	03	Analysis of filament reinforced met pressure vessels	al-shell	
HYI	DROSTATIC PRESSURE Hydrostatic testing of porous asse	mblies		LEWIS-10352	B68-10405	06
HYI	M-FS-18298 DROXIDES	B68-10439	05	DSN seven day/twelve week schedule NPO-10752	program B68-10410	06
	Improved fuel-cell-type hydrogen s M-FS-14656	ensor B68-10263	01	Computer program for machine design Cassegrain feed systems	of	
HYI	PERVELOCITY GUNS			NPO-10588	B68-10421	06
	Advances in light-gas gun technolo M-FS-14270	gy B68-10288	05	Symbolic reduction of block diagram FORMAC LEWIS-10409	s using B68-10423	06
ΗYI	PERVELOCITY PROJECTILES Advances in light-gas gun technolo M-FS-14270	gy B68-10288	05	Plume radiation program M-FS-13202	B68-10447	06
	1 .			Single degree of freedom antenna po	inting	
I 1	BEAMS Fiberglass-reinforced structural m	aterials		NPO-10756	B68-10449	06
	for aerospace application M-FS-14806	B68-10360	03	A request-oriented information sele program LEWIS-10255		06
IB	M COMPUTERS GERT simulation program for GERT n	etwork		Computer program for parameter	B68-10451	υo
	analysis ERC-10209	B68-10457	06	optimization ARC-10168	B68-10453	06

IDEAL GAS SUBJECT INDEX

IDEAL GAS			IMPEDANCE MATCHING		
Computer program for calculation of	ideal		Low-cost, fast-response drive circuit	it for	
gas thermodynamic data LEWIS→10254	B68-10025	06	electromagnetic torque motors LEWIS-10143	B68-10386	01
LEWIS-10204	500-10025	00	LEW13-10143	D00-10300	O.L
IDENTIFYING			IMPINGEMENT		
Product identification techniques use	ed as		Two-fluid, impinging-sheet injector	200 10000	
training aids for analytical chemi: SAN-10025	sts B68-10373	03	NPO-10547	B68-10338	05
DAR 10020	DOG 10075	00	IMPLOSIONS		
IGNITION			Study of cryogenic container thermo	dynamics	
Ignition of binary alloys of uranium			during propellant transfer	DC0 10100	
ARG-10057	B68-10280	01	M-FS-14310	B68-10108	20
IGNITION TEMPERATURE			INCANDESCENCE		
Evaluation of ignition mechanisms in			Silicon solar cell monitors high ter	mperature	
selected nonmetallic materials MSC-11645	B68-10167	03	furnace operation NUC-10163	B68-10148	01
HBC-11040	000-10107	0.5	NOC-10163	D00-10140	UI.
Ambient temperature catalyst for hyd	rogen		INCIDENT RADIATION		
ignition	DC0 10500	0.7	Optimetric system facilitates colori	imetric	
LEWIS-10551	B68-10520	03	and fluorometric measurements NPD-10233	B68-10316	01
IMAGE DISSECTOR TUBES			1 20200		
Improved electro-optical tracking sys			INCONEL (TRADEMARK)		
M-FS-14791	B68-10311	01	Asbestos and Inconel combined to for seal	rm hot-gas	
IMAGE FILTERS			M-FS-14004	B68-10162	05
Fluorescent particles enable visuali:	zation				
of gas flow	DC0 10050	••	Weld microfissuring in Inconel 718		
M-FS-14583	B68-10259	02	minimized by minor elements M-FS-18185	B68-10251	03
IMAGE INTENSIFIERS			15 10100	000 10001	••
Improved radiographic image amplifies			INDEPENDENT VARIABLES		
M-FS-14522	B68-10363	02	Independent doubly truncated gamma v M-FS-20143	variables B68-10345	02
IMAGING TECHNIQUES			N=F3=20143	000-10343	02
Electronic aperture control devised	for		Controllability of distributed-param	neter	
solid state imaging system	naa 10000		systems	DC0 10746	
M-FS-12428 · 1	B68-10028	01	M-FS-14929	B68-10346	02
New camera tube improves ultrasonic			Computer program for parameter		
inspection system			optimization		
ARG-90237	B68-10088	01	ARC-10168	B68-10453	06
Antiglare improvement for optical imp	aging		INDEXES (DOCUMENTATION)		
Antiglare improvement for optical im- systems	-		INDEXES (DOCUMENTATION)  JPKWIC - General key word in context	t and	
systems	aging B68-10090	02	JPKWIC - General key word in context subject index report generator		0.5
systems NPO-10337	-	02	JPKWIČ - General keý word in context	t and B68-10208	06
systems NPO-10337 Color-televised medical microscopy	-	02 01	JPKWIC - General key word in context subject index report generator		06
systems NPO-10337  Color-televised medical microscopy MSC-13086	B68-10090		JPKWIC - General key word in context subject index report generator NPD-10589  INDICATING INSTRUMENTS Detection and location of metallic of	B68-10208	06
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique	B68-10090	01	JPKWIC - General key word in context subject index report generator NPO-10589 INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures	B68-10208 objects	
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique	B68-10090		JPKWIC - General key word in context subject index report generator NPD-10589  INDICATING INSTRUMENTS Detection and location of metallic of	B68-10208	06
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1	B68-10090 B68-10314 B68-10434	01	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS Detection and location of metallic cimbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monit	B68-10208 objects s B68-10183	
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy	B68-10090 B68-10314 B68-10434	01 01	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS  Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monifin-process weld quality	B68-10208 objects s B68-10183	01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy	B68-10090 B68-10314 B68-10434	01	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS Detection and location of metallic cimbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monit	B68-10208 objects s B68-10183	
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining	B68-10090 B68-10314 B68-10434 ray B68-10546	01 01	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS  Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contents	B68-10208 objects s B68-10183 tors B68-10333	01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color	B68-10090 B68-10314 B68-10434 ray B68-10546 slides	01 01 02	JPKWIC - General key word in context subject index report generator NPD-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monit in-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor	B68-10208  objects  B68-10183  tors  B68-10333	01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color	B68-10090 B68-10314 B68-10434 ray B68-10546	01 01	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS  Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contents	B68-10208 objects s B68-10183 tors B68-10333	01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color	B68-10090 B68-10314 B68-10434 ray B68-10546 slides	01 01 02	JPKWIC - General key word in context subject index report generator NPD-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monit in-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor	B68-10208  objects B68-10183  tors B68-10333  venient B68-10341	01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X- astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560	01 01 02	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contiliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement	B68-10208  objects B68-10183  tors B68-10333  venient B68-10341	01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560	01 01 02 02	JPKWIC - General key word in context subject index report generator NPD-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monit in-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides of the subject of the subject of the subject in the subject of the subject in the subject of the subject in the subj	B68-10208  objects B68-10183  tors B68-10333  venient B68-10341	01 01 01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560	01 01 02 02	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contiliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement	B68-10208  objects B68-10183  tors B68-10333  venient B68-10341	01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g	01 01 02 02	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS  Detection and location of metallic simbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contiquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting	B68-10208  objects B68-10183  tors B68-10333  venient B68-10341  vertical B68-10359	01 01 01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved streen	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g	01 01 02 02	JPKWIC - General key word in context subject index report generator NPD-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monit in-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting nonconductive liquids	B68-10208  bbjects B68-10183  tors B68-10333  venient B68-10341  vertical B68-10359	01 01 01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved stre- rupture properties	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g B68-10277	01 01 02 02	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS  Detection and location of metallic simbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contiquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting	B68-10208  objects B68-10183  tors B68-10333  venient B68-10341  vertical B68-10359	01 01 01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved stre- rupture properties LEWIS-10283	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g	01 01 02 02	JPKWIC - General key word in context subject index report generator NPD-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monit in-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting nonconductive liquids	B68-10208  bbjects B68-10183  tors B68-10333  venient B68-10341  vertical B68-10359	01 01 01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved stre- rupture properties LEWIS-10283  IMPACTORS	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g B68-10277	01 01 02 02	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contiliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting nonconductive liquids M-FS-14713  INDIUM Indium adhesion provides quantitative	B68-10208  objects B68-10183  tors B68-10333  venient B68-10341  vertical B68-10359  leaks of B68-10303	01 01 01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X- astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved stre- rupture properties LEWIS-10283  IMPACTORS Versatile impact hand tool	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g B68-10277 ss B68-10344	01 01 02 02 05	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS Detection and location of metallic simbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contiquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting nonconductive liquids M-FS-14713  INDIUM Indium adhesion provides quantitatic measure of surface cleanliness	bes-10208  besides to the second seco	01 01 01 05
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X- astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved stre- rupture properties LEWIS-10283  IMPACTORS Versatile impact hand tool M-FS-20140	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g B68-10277	01 01 02 02	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting nonconductive liquids M-FS-14713  INDIUM Indium adhesion provides quantitatic measure of surface cleanliness SAN-10024	B68-10208  objects B68-10183  tors B68-10333  venient B68-10341  vertical B68-10359  leaks of B68-10303	01 01 01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X- astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved stre- rupture properties LEWIS-10283  IMPACTORS Versatile impact hand tool M-FS-20140  IMPEDANCE	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g B68-10277 ss B68-10344 B68-10371	01 01 02 02 05	JPKWIC - General key word in context subject index report generator NPD-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monit in-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting nonconductive liquids M-FS-14713  INDIUM Indium adhesion provides quantitatic measure of surface cleanliness SAN-10024	bes-10208  besides to the second seco	01 01 01 05
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved stre- rupture properties LEWIS-10283  IMPACTORS Versatile impact hand tool M-FS-20140  IMPEDANCE Silicon strain sensors enable pressu	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g B68-10277 ss B68-10344 B68-10371	01 01 02 02 05	JPKWIC - General key word in context subject index report generator NPD-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting nonconductive liquids M-FS-14713  INDIUM Indium adhesion provides quantitatic measure of surface cleanliness SAN-10024  INDUCTANCE Moebius resistor is noninductive and	bes-10208  besides to the second seco	01 01 01 05
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved stre- rupture properties LEWIS-10283  IMPACTORS Versatile impact hand tool M-FS-20140  IMPEDANCE Silicon strain sensors enable pressu- measurement at cryogenic temperatu	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g B68-10277 ss B68-10344 B68-10371	01 01 02 02 05	JPKWIC - General key word in context subject index report generator NPD-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monit in-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting nonconductive liquids M-FS-14713  INDIUM Indium adhesion provides quantitatic measure of surface cleanliness SAN-10024	bes-10208  besides to the second seco	01 01 01 05
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved streing rupture properties LEWIS-10283  IMPACTORS Versatile impact hand tool M-FS-20140  IMPEDANCE Silicon strain sensors enable pressu measurement at cryogenic temperature M-FS-14703	B68-10090 B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g B68-10277 ss B68-10371 re res B68-10262	01 01 02 02 05 03 05	JPKWIC - General key word in context subject index report generator NPD-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting nonconductive liquids M-FS-14713  INDIUM Indium adhesion provides quantitatic measure of surface cleanliness SAN-10024  INDUCTANCE Moebius resistor is noninductive and nonreactive SAN-10020	bes-10208  bejects  Bes-10183  tors  Bes-10333  venient  Bes-10341  vertical  Bes-10359  leaks of  Bes-10303  ve  Bes-10342  d  Bes-10267	01 01 01 05 3
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved stree rupture properties LEWIS-10283  IMPACTORS Versatile impact hand tool M-FS-20140  IMPEDANCE Silicon strain sensors enable pressu measurement at cryogenic temperatu M-FS-14703  Electron beam selectively seals poro	B68-10090 B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g B68-10277 ss B68-10371 re res B68-10262	01 01 02 02 05 03	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting nonconductive liquids M-FS-14713  INDIUM Indium adhesion provides quantitatic measure of surface cleanliness SAN-10024  INDUCTANCE Moebius resistor is noninductive and nonreactive SAN-10020  High-voltage pulse generator develop	bes-10208  bejects  Bes-10183  tors  Bes-10333  venient  Bes-10341  vertical  Bes-10359  leaks of  Bes-10303  ve  Bes-10342  d  Bes-10267	01 01 01 05 3
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X- astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved stre- rupture properties LEWIS-10283  IMPACTORS Versatile impact hand tool M-FS-20140  IMPEDANCE Silicon strain sensors enable pressu measurement at cryogenic temperatu M-FS-14703  Electron beam selectively seals poro- filters	B68-10090 B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g B68-10277 ss B68-10371 re res B68-10262	01 01 02 02 05 03 05	JPKWIC - General key word in context subject index report generator NPD-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monit in-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting monconductive liquids M-FS-14713  INDIUM Indium adhesion provides quantitatic measure of surface cleanliness SAN-10024  INDUCTANCE Moebius resistor is noninductive and nonreactive SAN-10020  High-voltage pulse generator develor wide-gap spark chambers	bes-10208  bejects  Bes-10183  tors  Bes-10333  venient  Bes-10341  vertical  Bes-10359  leaks of  Bes-10303  ve  Bes-10342  d  Bes-10267	01 01 01 05 3
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X- astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved stree rupture properties LEWIS-10283  IMPACTORS Versatile impact hand tool M-FS-20140  IMPEDANCE Silicon strain sensors enable pressu measurement at cryogenic temperatu M-FS-14703  Electron beam selectively seals poro filters LEWIS-10162	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g B68-10277 ss B68-10344 B68-10371 re res B68-10262 us metal B68-10331	01 01 02 02 05 03	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting nonconductive liquids M-FS-14713  INDIUM Indium adhesion provides quantitative measure of surface cleanliness SAN-10024  INDUCTANCE Moebius resistor is noninductive and nonreactive SAN-10020  High-voltage pulse generator develop wide-gap spark chambers ARG-10136	bes-10208  bejects  Bes-10183  tors  Bes-10333  venient  Bes-10341  vertical  Bes-10359  leaks of  Bes-10303  ve  Bes-10302  d  Bes-10342  d  Bes-10267  ped for	01 01 05 01 01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X- astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved stre- rupture properties LEWIS-10283  IMPACTORS Versatile impact hand tool M-FS-20140  IMPEDANCE Silicon strain sensors enable pressu measurement at cryogenic temperatu M-FS-14703  Electron beam selectively seals poro filters LEWIS-10162  Improved limiter for turn-on current	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g B68-10277 ss B68-10344 B68-10371 re res B68-10262 us metal B68-10331	01 01 02 02 05 03	JPKWIC - General key word in context subject index report generator NPD-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monit in-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting nonconductive liquids M-FS-14713  INDIUM Indium adhesion provides quantitatic measure of surface cleanliness SAN-10024  INDUCTANCE Moebius resistor is noninductive and nonreactive SAN-10020  High-voltage pulse generator develop wide-gap spark chambers ARG-10136  INDUCTION HEATING	bes-10208  bejects  Bes-10183  tors  Bes-10333  venient  Bes-10341  vertical  Bes-10359  leaks of  Bes-10303  ve  Bes-10302  d  Bes-10342  d  Bes-10267  ped for	01 01 05 01 01
systems NPO-10337  Color-televised medical microscopy MSC-13086  Selective video blanking technique M-FS-20013  Imaging slitless spectrometer for X-1 astronomy M-FS-14309  Shortened procedure for obtaining reproducible copies of 35 mm color KSC-09957  IMPACT RESISTANCE Thermal protective visor for entering high temperature areas MSC-10285  IMPACT TOLERANCES Nickel base alloy with improved stres rupture properties LEWIS-10283  IMPACTORS Versatile impact hand tool M-FS-20140  IMPEDANCE Silicon strain sensors enable pressus measurement at cryogenic temperatus M-FS-14703  Electron beam selectively seals poro filters LEWIS-10162  Improved limiter for turn-on current	B68-10090 B68-10314 B68-10434 ray B68-10546 slides B68-10560 g B68-10277 ss B68-10344 B68-10371 re res B68-10262 us metal B68-10331	01 01 02 02 05 03	JPKWIC - General key word in context subject index report generator NPO-10589  INDICATING INSTRUMENTS Detection and location of metallic imbedded in nonmetallic structures M-FS-14790  Automatic, nondestructive test monitin-process weld quality M-FS-14996  Superconductive thin film makes contliquid helium level sensor LANGLEY-10289  Remotely operated gripper provides a control rod movement ARG-10160  INDICATORS Conceptual apparatus for detecting nonconductive liquids M-FS-14713  INDIUM Indium adhesion provides quantitative measure of surface cleanliness SAN-10024  INDUCTANCE Moebius resistor is noninductive and nonreactive SAN-10020  High-voltage pulse generator develop wide-gap spark chambers ARG-10136	bes-10208  bejects  Bes-10183  tors  Bes-10333  venient  Bes-10341  vertical  Bes-10359  leaks of  Bes-10303  ve  Bes-10303	01 01 05 01 01

SUBJECT INDEX INTEGRATED CIRCUITS

ARG-10177 INERT ATMOSPHERE	B68-10418	02	INSPECTION Optical system facilitates inspection printed circuit boards	on of	
Quasi-static vapor pressure measur on reactive systems in inert atm ARG-90142		01	GSFC-07971  New camera tube improves ultrasonic	B68-10021	02
Titanium-nitrogen reaction investi		/	inspection system ARG-90237	B68-10088	01
application to gettering systems ARG-10208	B68-10414	03	Inspection criteria ensure quality of parallel gap soldering	control	
INERTIA Concept for sleeve induction motor	with		M-FS-14530	B68-10257	05
1-msec mechanical time constant ARG-10124	B68-10185	01	Training manuals for nondestructive using magnetic particles M-FS-20187	testing B68-10391	03
INFLATABLE STRUCTURES Preumatic raft automatically refor	ms after		INSTALLING	·	0.5
rupture of buoyant member MSC-11562	B68-10011	05	Vacuum-jacketed transfer line insta technique M-FS-14496	11ation B68-10125	05
INFORMATION RETRIEVAL			11 10 14400	200 10120	••
Hydra 1 data display system MSC-11594	B68-10155	01	INSTRUMENT COMPENSATION Low-cost, fast-response drive circu electromagnetic torque motors	it for	
JPKWIC - General key word in conte subject index report generator	xt and		LEWIS-10143	B68-10386	01
NPO-10589	B68-10208	06	INSTRUMENTS Environmental test planning, select		
Long-term data storage and retriev	al		and standardization aids available SAN-10028	e B68-10445	06
system, a concept M-FS-14789	B68-10505	01	24W-10059	B00-10445	00
			INSULATION		
INFRARED INSTRUMENTS	_		Method of measuring thermal conduct	ivity of	
Infrared viewing permits human iri response studies	S		high performance insulation M-FS-14088	B68-10013	02
ERC-10003	B68-10206	04	11 13 14000	200 20020	-
			Panelized high performance multilay	er	
INFRARED LASERS Electro-optic modulator for infrar	ed lacer		insulation M-FS-14023	B68-10031	03
using gallium arsenide crystal	ed laser		N 15 14020	200 10001	•••
GSFC-10686	B68-10255	02	Simple test for physical stability	of	,
Repetitively pulsed, wavelength-se	lective		cryogenic tank insulation M-FS-12547	B68-10048	03
carbon dioxide laser ERC-10178	B68-10564	02	Lightweight heater generates high		
	DOO 10004		temperatures from low current SAN-10004		01
				B68-10223	
INFRARED RADIATION Optical integrating sphere operate	s at		3NN-10004	B68-10223	01
Optical integrating sphere operate visible and infrared wavelengths			Moebius resistor is noninductive an		01
Optical integrating sphere operate		02	Moebius resistor is noninductive an nonreactive	d	
Optical integrating sphere operate visible and infrared wavelengths	B68-10126	02	Moebius resistor is noninductive an		01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248 Standards for compatibility of pri circuit and component lead mater	B68-10126 nted ials		Moebius resistor is noninductive an nonreactive SAN-10020 Fiberglass prevents cracking of	ad B68-10267	
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248 Standards for compatibility of pri	B68-10126	02	Moebius resistor is noninductive an nonreactive SAN-10020	ad B68-10267	
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248 Standards for compatibility of pri circuit and component lead mater	B68-10126 nted ials B68-10310	01	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058	ad B68-10267	
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pri circuit and component lead mater M-FS-14531  Automatic, nondestructive test mon	B68-10126 nted ials B68-10310		Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS	nd B68-10267 Pryogenic B68-10406	01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pri circuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality	B68-10126 nted ials B68-10310 itors	01	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058	nd B68-10267 Pryogenic B68-10406	01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pricircuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for roc	B68-10126  nted ials B68-10310  itors B68-10333	01	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor	nd B68-10267 Pryogenic B68-10406	01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pri circuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for roc exhaust analysis	B68-10126 nted ials B68-10310 itors B68-10333	01	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124	d B68-10267 Tyogenic B68-10406	01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pricircuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for rocexhaust analysis M-FS-14357	B68-10126  nted ials B68-10310  itors B68-10333	01	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS  Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS  Linear systems of equations solved	B68-10267  Pryogenic  B68-10406  With  B68-10185	01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pricircuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for rocexhaust analysis M-FS-14357  INFRARED SPECTROSCOPY	B68-10126  nted ials B68-10310  itors B68-10333  ket B68-10081	01	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms	B68-10267  Pryogenic  B68-10406  With  B68-10185	01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pricircuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for rocexhaust analysis M-FS-14357	B68-10126  nted ials B68-10310  itors B68-10333  ket B68-10081	01	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS  Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS  Linear systems of equations solved mathematical algorithms  ARG-10146	B68-10267  Pryogenic  B68-10406  With  B68-10185	01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pri circuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for roc exhaust analysis M-FS-14357  INFRARED SPECTROSCOPY The preparation, identification and	B68-10126  nted ials B68-10310  itors B68-10333  ket B68-10081	01	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms ARG-10146  INTEGRATED CIRCUITS	B68-10267  Pryogenic  B68-10406  With  B68-10185  Using  B68-10292	01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pri circuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for roc exhaust analysis M-FS-14357  INFRARED SPECTROSCOPY The preparation, identification an properties of chlorophyll deriva	### B68-10126  ### B68-10310  ### B68-10333  ### ### B68-10081  ### ### ### #### ###################	01 01 02	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS  Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS  Linear systems of equations solved mathematical algorithms  ARG-10146	B68-10267  Pryogenic  B68-10406  With  B68-10185  Using  B68-10292	01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pricircuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for rocexhaust analysis M-FS-14357  INFRARED SPECTROSCOPY The preparation, identification an properties of chlorophyll deriva ARG-10205  INLET FLOW Venturi meter with separable diffu	### ### ##############################	01 01 02	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms ARG-10146  INTEGRATED CIRCUITS Dc pin-to-pin testing of integrated	B68-10267  Pryogenic  B68-10406  With  B68-10185  Using  B68-10292	01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pri circuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for roc exhaust analysis M-FS-14357  INFRARED SPECTROSCOPY The preparation, identification an properties of chlorophyll deriva ARG-10205	### B68-10126  ### B68-10310  ### B68-10333  ### ### B68-10081  ### ### ### ### ### #### #### ########	01 01 02	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms ARG-10146  INTEGRATED CIRCUITS Dc pin-to-pin testing of integrated circuits GSFC-10284	B68-10267  Pryogenic  B68-10406  With  B68-10185  Using  B68-10292	01 02 01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pricircuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for rocexhaust analysis M-FS-14357  INFRARED SPECTROSCOPY The preparation, identification an properties of chlorophyll deriva ARG-10205  INLET FLOW Venturi meter with separable diffulewis-10483  INLET NOZZLES	### ### ##############################	01 01 02	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms ARG-10146  INTEGRATED CIRCUITS Dc pin-to-pin testing of integrated circuits GSFC-10284  Small, low power analog-to-digital converter	B68-10267  Fryogenic  B68-10406  With  B68-10185  Using  B68-10292	01 02 01 06
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pri circuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for roc exhaust analysis M-FS-14357  INFRARED SPECTROSCOPY The preparation, identification an properties of chlorophyll deriva ARG-10205  INLET FLOW Venturi meter with separable diffulewis-10483	### ### ##############################	01 01 02	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polywrethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms ARG-10146  INTEGRATED CIRCUITS Dc pin-to-pin testing of integrated circuits GSFC-10284  Small, low power analog-to-digital converter M-FS-13954	B68-10267  Pryogenic  B68-10406  With  B68-10185  Using  B68-10292	01 02 01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pri circuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for roc exhaust analysis M-FS-14357  INFRARED SPECTROSCOPY The preparation, identification an properties of chlorophyll deriva ARG-10205  INLET FLOW Venturi meter with separable diffurity in the preparation of the separable diffurity in the separable diffurity in the separable diffurity was a separable diffurity in the separable diffurity was a separable diffurity in the separable	### B68-10126  ### B68-10310  ### B68-10333  ### ### B68-10081  ### ### ### ### ### ####  ### ### ###	01 01 02 03	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms ARG-10146  INTEGRATED CIRCUITS Dc pin-to-pin testing of integrated circuits GSFC-10284  Small, low power analog-to-digital converter	B68-10267  Fryogenic  B68-10406  With  B68-10185  Using  B68-10292	01 02 01 06
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pri circuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for roc exhaust analysis M-FS-14357  INFRARED SPECTROSCOPY The preparation, identification an properties of chlorophyll deriva ARG-10205  INLET FLOW Venturi meter with separable diffu LEWIS-10483  INLET NOZZLES Venturi meter with separable diffu LEWIS-10483  INPUT Input gate circuit converted for ware and the separable of the separable diffuring the separable diffur	### B68-10126  ### B68-10310  ### B68-10333  ### ### B68-10081  ### ### ### ### ### ###  ### ### ###	01 01 02 03	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms ARG-10146  INTEGRATED CIRCUITS Dc pin-to-pin testing of integrated circuits GSFC-10284  Small, low power analog-to-digital converter M-FS-13954  Accumulator for shaft encoder M-FS-13599	B68-10267  Fryogenic  B68-10406  With  B68-10185  Using  B68-10292  B68-10001	01 02 01 06 01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pricircuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS    Infrared spectroradiometer for roce exhaust analysis M-FS-14357  INFRARED SPECTROSCOPY    The preparation, identification and properties of chlorophyll deriva ARG-10205  INLET FLOW    Venturi meter with separable diffusively in the separable diffus	### B68-10126  ### B68-10310  ### B68-10333  ### ### ### ### ### ###  ### ### ##	01 01 02 03 05	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms ARG-10146  INTEGRATED CIRCUITS Dc pin-to-pin testing of integrated circuits GSFC-10284  Small, low power analog-to-digital converter M-FS-13954  Accumulator for shaft encoder M-FS-13599  Piggy-back mounting would increase	B68-10267  Fryogenic  B68-10406  With  B68-10185  Using  B68-10292  B68-10001	01 02 01 06 01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pri circuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for roc exhaust analysis M-FS-14357  INFRARED SPECTROSCOPY The preparation, identification an properties of chlorophyll deriva ARG-10205  INLET FLOW Venturi meter with separable diffu LEWIS-10483  INLET NOZZLES Venturi meter with separable diffu LEWIS-10483  INPUT Input gate circuit converted for ware and the separable of the separable diffuring the separable diffur	### B68-10126  ### B68-10310  ### B68-10333  ### ### B68-10081  ### ### ### ### ### ###  ### ### ###	01 01 02 03	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms ARG-10146  INTEGRATED CIRCUITS Dc pin-to-pin testing of integrated circuits GSFC-10284  Small, low power analog-to-digital converter M-FS-13954  Accumulator for shaft encoder M-FS-13599	B68-10267  Fryogenic  B68-10406  With  B68-10185  Using  B68-10292  B68-10001	01 02 01 06 01 01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pricircuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS Infrared spectroradiometer for roce exhaust analysis M-FS-14357  INFRARED SPECTROSCOPY The preparation, identification and properties of chlorophyll deriva ARG-10205  INLET FLOW Venturi meter with separable diffusiventuri meter with separab	### B68-10126  ### B68-10310  ### B68-10333  ### ### B68-10081  ### B68-10409  ### B68-10409  ### B68-10295  ### ### B68-10295  ### ### ### ### ### ####  ### ### ###	01 01 02 03 05	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms ARG-10146  INTEGRATED CIRCUITS Dc pin-to-pin testing of integrated circuits GSFC-10284  Small, low power analog-to-digital converter M-FS-13954  Accumulator for shaft encoder M-FS-13599  Piggy-back mounting would increase microcircuit packaging density MSC-12059	B68-10267  Fryogenic  B68-10406  With  B68-10185  Using  B68-10292  B68-10001  B68-10001  B68-10016	01 02 01 06 01 01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pricircuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS  Infrared spectroradiometer for roce thaust analysis M-FS-14357  INFRARED SPECTROSCOPY  The preparation, identification and properties of chlorophyll derivation and ARG-10205  INLET FLOW Venturi meter with separable diffure LEWIS-10483  INLET NOZZLES  Venturi meter with separable diffure LEWIS-10483  INPUT  Input gate circuit converted for unlinear amplifier M-FS-14265  Tool reconstructs data input point corresponding to first order out	### B68-10126  ### B68-10310  ### B68-10333  ### ### B68-10081  ### ### ### ### ### ###  ### ### ###	01 01 02 03 05	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms ARG-10146  INTEGRATED CIRCUITS Dc pin-to-pin testing of integrated circuits GSFC-10284  Small, low power analog-to-digital converter M-FS-13559  Piggy-back mounting would increase microcircuit packaging density MSC-12059  Active RC networks of low sensitivi	B68-10267  Pryogenic  B68-10406  With  B68-10185  Using  B68-10292  B68-10001  B68-10016  B68-10093  B68-10114  Hity for	01 02 01 06 01 01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pricircuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS  Infrared spectroradiometer for roce exhaust analysis M-FS-14357  INFRARED SPECTROSCOPY  The preparation, identification and properties of chlorophyll deriva ARG-10205  INLET FLOW  Venturi meter with separable diffusively in the separable diffusively	B68-10126  nted ials B68-10310  itors B68-10333  ket B68-10081  d tives B68-10409  Ser B68-10295  se as B68-10155 sput graph B68-10154	01 01 02 03 05 05	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polyurethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms ARG-10146  INTEGRATED CIRCUITS Dc pin-to-pin testing of integrated circuits GSFC-10284  Small, low power analog-to-digital converter M-FS-13954  Accumulator for shaft encoder M-FS-13599  Piggy-back mounting would increase microcircuit packaging density MSC-12059  Active RC networks of low sensitivi integrated circuit transfer funct synthesis	B68-10267  Fryogenic  B68-10406  With  B68-10185  Using  B68-10292  B68-10001  B68-10001  B68-10016  B68-10016	01 02 01 06 01 01 01
Optical integrating sphere operate visible and infrared wavelengths M-FS-14248  Standards for compatibility of pricircuit and component lead mater M-FS-14531  Automatic, nondestructive test mon in-process weld quality M-FS-14996  INFRARED SPECTROPHOTOMETERS  Infrared spectroradiometer for roce thaust analysis M-FS-14357  INFRARED SPECTROSCOPY  The preparation, identification and properties of chlorophyll derivation and ARG-10205  INLET FLOW Venturi meter with separable diffure LEWIS-10483  INLET NOZZLES  Venturi meter with separable diffure LEWIS-10483  INPUT  Input gate circuit converted for unlinear amplifier M-FS-14265  Tool reconstructs data input point corresponding to first order out	B68-10126  nted ials B68-10310  itors B68-10333  ket B68-10081  d tives B68-10409  Ser B68-10295  se as B68-10155 sput graph B68-10154	01 01 02 03 05 05	Moebius resistor is noninductive an nonreactive SAN-10020  Fiberglass prevents cracking of polywrethane foam insulation on c vessels M-FS-20058  INTAKE SYSTEMS Concept for sleeve induction motor 1-msec mechanical time constant ARG-10124  INTEGERS Linear systems of equations solved mathematical algorithms ARG-10146  INTEGRATED CIRCUITS Dc pin-to-pin testing of integrated circuits GSFC-10284  Small, low power analog-to-digital converter M-FS-13954  Accumulator for shaft encoder M-FS-13599  Piggy-back mounting would increase microcircuit packaging density MSC-12059  Active RC networks of low sensitivi integrated circuit transfer funct	B68-10267  Pryogenic  B68-10406  With  B68-10185  Using  B68-10292  B68-10001  B68-10016  B68-10093  B68-10114  Hity for	01 02 01 06 01 01

INTEGRATORS SUBJECT INDEX

Random access-random release relay			INTRAVENOUS PROCEDURES	
switching matrix M-FS-12590	B68-10301	01	Experimental study and evaluation of radioprotective drugs	
15 12050	DOO 10001	0.1		8-10320 04
Improved process for epitaxial depo				
of silicon on prediffused substra M-FS-14910	tes B68-10390	03	INVARIANCE Solution of differential equations by	
	2 2	•••	application of transformation groups	
Amplifier improvement circuit	DC0 10456		M-FS-14802 B68	8-10276 02
LEWIS-10712	B68-10456	01	INVERSIONS	
INTEGRATORS			Controllability of distributed-parameter	er
Recharge unit provides for optimum			systems	8-10346 02
recharging of battery cells GSFC-10688	B68-10273	01	M-FS-14929 B68	5-10346 UZ
			INVERTERS	
Solution of differential equations			Parallel-to-serial biphase-data conver- MSC-11600 B6	
application of transformation gro M-FS-14802	ups B68-10276	02	M2C-11600 Box	8-10241 01
			INVESTIGATION	
System measures arc energy dissipat relay contact cycling	ed in		Computer magnetic tape rehabilitation : GSFC-10283 B6	study 8–10035 05
M-FS-14541	B68-10312	01	631-C-10203	B-10033 03
			Glassy materials investigated for nucle	ear
INTERACTIONS Four pi-recoil proportional counter	ueed se		reactor applications ARG-10075 B6	8-10103 03
neutron spectrometer	useu as		HIG 10010	0 10100 00
ARG-10101	B68-10326	02	Automatic planning concept - An analys	is of
Shock and vibration response of mul	tistage		optimum scheduling M-FS-14198 B6	8-10127 06
structure	tistage		11 10 14100	5 10127 00
M-FS-14972	B68-10353	05	Squeeze-film gas bearing technology	. 10100 05
INTERFACES			M-FS-14821 B6	8-10180 05
Study of behavior of sterols at int			Study of convective magnetohydrodynamic	С
ARG-10085	B68-10281	03	channel flow	0 10101 00
Fluidic-thermochromic display devic	e		ARG-10102 B6	8-10181 02
ERC-10031	B68-10350	01	Reaction studied of steam with niobium	and
INTERFACIAL TENSION			tantalum ARG-10051 B6	8-10189 03
· Optimetric system facilitates color	imetric		ARG-10051 B00	0-10103 03
and fluorometric measurements			INVISCID FLOW	
NPO-10233	B68-10316	01	<pre>Large-amplitude inviscid fluid motion :     accelerating container</pre>	in an
Dynamics of moving bubbles in singl	e and			8-10170 02
binary component systems M-FS-14845	D.C. 10770			
M-F2-14045	B68-10339	02	Axisymmetric two-phase perfect gas performance program	
INTERFERENCE				8-10374 06
Improvement in recording and readin holograms	g		One-dimensional two-phase reacting gas	
ERC-10151	B68-10347	02	nonequilibrium performance program	
THEODODANULAD CODDOCTON			MSC-11780 B6	8-10376 06
INTERGRANULAR CORROSION Weld microfissuring in Inconel 718			IODINE ISOTOPES	
minimized by minor elements			An economical method for the continuous	s
M-FS-18185	B68-10251	03	production of iodine-123 LEWIS-10518 B6	8-10433 03
Effects of high frequency current i	n weldina		FEM12-10218 RO	8-10433 03
aluminum alloy 6061	-		ION ENGINES	
M-FS-18337	B68-10383	05	Reducing bubbles in glass coatings imp electrical breakdown strength	roves
INTERMETALLICS				8-10214 03
Crystal structure analysis of inter	metallic			
compounds ARG-10092	B68-10198	03	Glass coated single grid for charged particle acceleration	3
				8-10215 03
High temperature alloy LEWIS-10377	B68-10253	0.7	TON EVOLANCE DESTRO	
LEWIS-105//	000-10255	03	ION EXCHANGE RESINS  Nitric acid-organic mixtures surveyed:	for
Microprobe investigation of brittle			use in separation by anion exchange	methods
segregates in aluminum MIG and TI M-FS-14720	G welds B68-10334	03	ARG-10065 B6	8-10425 03
	200 10004	00	ION EXCHANGING	
INTERNAL FRICTION			Improved fuel-cell-type hydrogen senso	
Stress-corrosion-induced property c in aluminum alloys	nanges		M-FS-14656 B6	8-10263 01
M-FS-20209	B68-10568	03	Nitric acid-organic mixtures surveyed	
INTERPLANETARY TRAJECTORIES			use in separation by anion exchange:	
Computer program for interplanetary	conic		ARG-10065 B6	8-10425 03
patching			ION IRRADIATION	
M-FS-14296	B68-10033	06	Hydrogen peroxide etching proves usefu germanium	l for
INTERPOLATION				8-10454 03
Real fluid properties of normal and	l		TON MICHOCCOPE	
parahydrogen LEWIS-10458	B68-10361	06	ION MICROSCOPES  High-temperature thermionic emission	

mi croscope NPO-10584	B68-10516	01	ISOTOPIC LABELING  The preparation, identification and  properties of chlorophyll derivatives	
IONIC REACTIONS			ARG-10205 B68-1040	9 03
Improved fuel-cell-type hydrogen sen M-FS-14656	B68-10263	01	ITERATIVE SOLUTION Study of optimum discrete estimators in	
IONIZING RADIATION  Experimental study and evaluation of radioprotective drugs	:	,	measurement analysis M-FS-14915 B68-1034	8 02
	B68-10320	04	FORTRAN optical lens design program NPO-10603 B68-1035	4 06
Rate constants measured for hydrated electron reactions with peptides a proteins			J	
ARG-10195	B68-10424	04	J- 2 ENGINE	
Readout system for radiation detecto			Dynamically stable check valve concept for wide flow range	
MSC-90180	B68-10501	01	M-FS-14579 B68-1024	7 05
IONS			JACKETS	
Ion plating technique improves thin deposition SAN-10006	Film B68-10212	03	Consolidation and fabrication techniques for vanadium-20 w/o titanium /TV-20/ ARG-10148 B68-1036	8 03
				•
IRON High-emittance coatings on metal sub LEWIS-10325	strates B68-10381	03	JET AIRCRAFT  Nickel base alloy with improved stress rupture properties LEWIS-10283  B68-1034	4 03
IRON ALLOYS			LEW15-10265 B00-1034	4 05
Study reveals effect of aluminum on saturation moment of Fe-Ni alloys ARG-90259	B68-10172	03	JET ENGINES Pre-weld heat treatment improves welds in Rene 41	
		•••	M-FS-18174 B68-1028	5 03
Inspection criteria ensure quality of	control		JOINING	
of parallel gap soldering M-FS-14530	B68-10257	05	Standards for compatibility of printed circuit and component lead materials	0 01
IRON COMPOUNDS  Ceric and ferrous dosimeters show pr	recision		M-FS-14531 B68-1031	0 01
for 50-5000 rad range ARG-10173	B68-10426	02	JOINTS (JUNCTIONS) Flare angles measured with ball gage M-FS-14690 B68-1003	50 O1
IRON OXIDES				
The thermodynamic properties of the phase are studied	wustite		Heat-shrink plastic tubing seals joints in glass tubing	
ARG-10200	B68-10408	03	LEWIS-10329 B68-1004	0 05
Ambient temperature catalyst for hydigation	_		Method for reinforcing tubing joints MSC-11108 B68-101.1	.5 05
LEWIS-10551	B68-10520	03	Asbestos and Inconel combined to form hot-ga	ıs
IRRADIATION High-voltage pulse generator develop	ed for		seal M-FS-14004 B68-1016	2 05
wide-gap spark chambers ARG-10136	B68-10283	01	Tube swaging device uses explosive force	os
Detection sensitivities in 3-8 MeV			LANGLEY-10092 B68-1023	35 ,05
neutron activation ARG-10210	B68-10298	02	Conceptual apparatus for detecting leaks of nonconductive liquids M-PS-14713 B68-103(	3 01
Consolidation and fabrication techni				
for vanadium-20 w/o titanium /TV-7 ARG-10148	20/ B68-10368	03	Determining gas leakage from bubble formations M-FS-14841 B68-1039	3 05
ISOLATION				
Biological isolation garment MSC-12206	B68~10500	04	Hand-tightened, high-pressure seal M-FS-18416 B68-1041	l7 05
ISOLATORS Improved traveling wave maser ampli:	fier		Tube joint leak repair coupling MSC-15022 B68-1054	10 05
NPO-10548	B68-10244	01	IONOVAL DRABITMOS	
ISOTHERMS			JOURNAL BEARINGS Shallow grooves in journal improve air	
Real fluid properties of normal and parahydrogen			bearing performance LEWIS-10396 B68-1013	34 05
LEWIS-10458	B68-10361	06	Low cost techniques for fabricating lobed	
ISOTOPES Portable, high intensity isotopic no	eutron		bearings LEWIS-10296 B68-1044	¥1 05
source provides increased experime			K	
accuracy ARG-90250	B68-10243	02	, <b>IX</b>	
Isotopically pure magnesium isotope- prepared from magnesium-24 oxide	-24 is		KALMAN-SCHMIDT FILTERING New technique for optimal smoothing of data MSC-11354 B68-100	50 02
ARG-10154	B68-10293	02	KERR CELLS	_

amplitude modulation of light M-FS-14268 B68-102	75 02	use in separation by anion exchange methods ARG-10065 B68-10425	
KINETICS Reaction studied of steam with niobium and		LAPLACE TRANSFORMATION Symbolic reduction of block diagrams using	
tantalum ARG-10051 B68-101	89 03	FORMAC LEWIS-10409 B68-10423	06
Study of radiation effects on mammalian cel	ls	One-dimensional coulomb-damped wave motion	
in vitro ARG-10191 B68-102:	94 02	in prismatic bars M-FS-14815 B68-10548	02
One-dimensional reacting gas nonequilibrium		LASER OUTPUTS	•••
performance program MSC-11777 B68-103		Feasibility study of wireless power transmission systems	•
One-dimensional two-phase reacting gas		M-FS-14691 B68-10309	01
nonequilibrium performance program MSC-11780 B68-103'	76 06	Laser Doppler gas-velocity instrument M-FS-20039 B68-10349	02
KLYSTRONS Solid state high-voltage pulser operates		Digital laser-beam deflection sensor M-FS-14785 B68-10525	01
with low supply voltage M-FS-14034 B68-1030	08 01	LASERS	-
KOVAR (TRADEMARK)		Flow tube used to cool solar-pumped laser	
Multichip packaging with thermal insulation M-FS-14076 B68-101:		MSC-11026 - B68-10010	02
Indium adhesion provides quantitative		Electronic gating circuit and ultraviolet laser excitation permit improved dosimeter	
measure of surface cleanliness SAN-10024 B68-1034	42 01	sensitivity ARG-10109 B68-10077	02
,			V2
LABORATORIES		Feasibility study of wireless power transmission systems	
Chemistry laboratory safety manual		M-FS-14691 B68-10309	01
available SAN-10030 B68-104	19 03	Improved electro-optical tracking system M-FS-14791 B68-10311	01
Rotary-knife stripper facilitates removal of X-ray film from pack		Rapid-response, light-exposure control system	
M-FS-14837 B68-1050	09 05	NPO-10238 B68-10502	01
LABORATORY EQUIPMENT		Digital laser-beam deflection sensor	
Color-televised medical microscopy MSC-13086 B68-1031	14 01	M-FS-14785 B68-10525	01
Product identification techniques used as		LATCHES Toggle operated double latch	
training aids for analytical chemists SAN-10025 B68-1037	73 03	MSC-11377 B68-10117	05
Heat-load simulator for heat sink design		Boydbolt, a positive-latch, simple-release fastener	
MSC-15170 B68-1053	10 02	MSC-13061 B68-10512	05
Dispensing graduate for butadiene NPO-10070 B68-1052	24 03	LATITUDE Theory of a refined earth model M-FS-14679 B68-10228	
LAMINAR FLOW			02
Computer program calculates velocities and streamlines in turbomachines		LATTICE PARAMETERS  Crystal structure analysis of intermetallic	
LEWIS-10252 B68-1009	97 06	compounds ARG-10092 B68-10198	03
LAMINATES Panelized high performance multilayer		LAUNCH VEHICLES	
insulation M-FS-14023 B68-1003	31 03	Concept to standardize space vehicle piggyback experiment modules	*
Molding a high-density laminate	, ,	M-FS-1697 B68-10038	05
LANGLEY-10051 B68-1009	92 03	Assembly, checkout, and operation optimization analysis technique for	
Laminated sheet composites reinforced with modular filament sheet		complex systems M-FS-14105 B68-10222	05
M-FS-14575 B68-1014	16 03	LAYERS	
Multilayer plated wire shows promise as memory device MSC-11587 B68-1021	ne or	Improved radiographic image amplifier panel M-FS-14522 B68-10363	02
	05 01	LC CIRCUITS	
Improved process for epitaxial deposition of silicon on prediffused substrates		Improved limiter for turn-on current transient	
M-FS-14910 B68-1039	90 03	GSFC-10413 B68-10384	01
Conditioning flat conductors for flat conductor cable production		LEAD (METAL) X-ray film holder permits single	
M-FS-14914 B68-1042	29 01	continuous picture of tubing joint	
LANTHANUM COMPOUNDS Nitric acid-organic mixtures surveyed for		LEWIS-10382 B68-10343	05

SUBJECT INDEX LIMITER CIRCUITS

	•				
LEAKAGE Vent and relief valve maintains low leakage rate over broad temperatu M-FS-12807		<b>05</b> .	LIFE SUPPORT SYSTEMS  Concept to comfort-condition subject wearing restrictive clothing MSC-10964	ts B68-10178	02
1 4			Plantaniutta ottuva taa ooli okemiti		
Locating and sealing air leaks in multiroomed buildings NUC-10304	B68-10024	05	Electrolytic silver ion cell sterili water supply MSC-11827	B68-10555	01
Device consider controlled on look			ITET DEUTADO		
Device provides controlled gas leak NPO-10298	B68-10142	03	LIFT DEVICES  Conceptual dead weight device to propressure calibration	ovide	
Tube swaging device uses explosive LANGLEY-10092	force B68-10235	05	M-FS-14672	B68-10264	01
Spiral-grooved shaft seals substant	ially		Air Bearing Lift Pad /ABLP/ M-FS-14685	B68-10442	05
reduce leakage and wear LEWIS-10397	B68-10270	05	LIGHT (VISIBLE RADIATION) Optical integrating sphere operates	at	
Between-bearing shaft seal, a conce M-FS-18179	pt B68-10286	05	visible and infrared wavelengths M-FS-14248	B68-10126	02
Conceptual apparatus for detecting	leaks of		Improved gas ring laser	B68-10304	02
nonconductive liquids M-FS-14713	B68-10303	01	MSC-11584	D00-10304	02
Determining gas leakage from bubble	<b>:</b>		System converts optical phase change RF phase changes		
formations M-FS-14841	B68-10393	05	M-FS-20091	B68-10430	01
		00	LIGHT AMPLIFIERS		
Nondestructive testing of brazed ro engine components	cket	•	Synthesis of electro-optic modulator amplitude modulation of light	rs for	
M-FS-18191	B68-10394	03	M-FS-14268	B68-10275	02
Tube joint leak repair coupling			LIGHT BEAMS		
MSC-15022	B68-10540	05	High-speed camera synchronization M-FS-18062	B68-10282	02
Reliable method for testing gross l	eaks in		Madiata atua ban danta maranga a	13	
semiconductor component packages ERC-10150	B68-10562	01	Modified sine bar device measures so angles with high accuracy GSFC-438	B68-10322	02
LEAST SQUARES METHOD					
Computer graphics data conditioning M-FS-14695	B68-10296	06	Improvement in recording and reading holograms ERC-10151	g B68-10347	02
FORTRAN optical lens design program NPO-10603	B68-10354	06	LIGHT EMISSION  Fluidic-thermochromic display device	e	
LENS DESIGN Optimetric system facilitates color			ERC-10031	B68-10350	01
and fluorometric measurements NPO-10233	B68-10316	01	Improved radiographic image amplific M-FS-14522	er panel B68-10363	02
LENGRA			LTOUR OAG OUNG		
LENSES Feasibility study of wireless power	-		LIGHT GAS GUNS Advances in light-gas gun technolog	y	
transmission systems			M-FS-14270	B68-10288	05
M-FS-14691	B68-10309	01	LIGHT SCATTERING		
Color-televised medical microscopy MSC-13086	B68-10314	01	Laser Doppler gas-velocity instrume M-FS-20039	nt B68–10349	02
Improvement in recording and reading	na		Detection of effect of deposits on	optical	
holograms			windows of pyrometer measurements		
ERC-10151	B68-10347	02	LEWIS-10366	B68-10367	01
FORTRAN optical lens design program NPO-10603	n B68-10354	06	LIGHT SOURCES Infrared viewing permits human iris		
UV detector monitors organic contar	nination		response studies ERC-10003	B68-10206	04
of optical surfaces				2	
M-FS-20246  Digital laser-beam deflection senso	B68-10413	01	Color-televised medical microscopy MSC-13086	B68-10314	01
M-FS-14785	B68-10525	01	Gimbal angle sensor GSFC-10305	B68-10315	01
LIBRARIES					
JPKWIC - General key word in contex subject index report generator NPO-10589	кт and В68-10208	06	Rapid-response, light-exposure cont system NPO-10238	B68-10502	01
	200 10000				
LIE GROUPS Solution of differential equations	by		LIGHT TRANSMISSION Technique developed for measuring		
application of transformation gro	oups		transmittance of optical birefrin	gent .	
M-FS-14802	B68-10276	02	networks M-FS-14267	B68-10260	02
LIFE (DURABILITY)				P00-10500	
Predicting fatigue life of metal be M-FS-14096	ellows B68-10026	0.5	LIMITER CIRCUITS Current-limiting voltage regulator MSC-11824	B68-10305	01

Improved limiter for turn-on current transient GSFC-10413 B68	3-10384	01	High-pressure gas facilitates calib turbine flowmeters for liquid hyd LEWIS-10402	ration of rogen B68-10145	01
LIMITS (MATHEMATICS)  Computer program determines exact two-s tolerance limits for normal distribut			Hydrogen safety manual LEWIS-10487	B68-10323	01
		06	Heat transfer coefficients for liqui hydrogen turbopumps M-FS-18345	id B68-10517	02
Input gate circuit converted for use as linear amplifier		01	LIQUID LEVELS Electronic circuit provides automati		<b>.</b>
LINEAR EQUATIONS Solution of differential equations by			control for liquid mitrogen traps KSC-10127	B68-10061	01
application of transformation groups M-FS-14802 B68	3-10276	02	Cryogenic liquid level measuring pro ARG-10138	be B68-10291	01
Linear systems of equations solved usin mathematical algorithms ARG-10146 B68	•	06	Superconductive thin film makes conv liquid helium level sensor LANGLEY-10289	venient B68-10341	01
LINEAR FILTERS  Design of dissipative linear phase filt M-FS-14698  B68		01	LIQUID METALS Concept to convert electrical power GSFC-10222	B68-10321	01
LINEAR PROGRAMMING Automatic planning concept - An analysi optimum scheduling		*	LIQUID NITROGEN  Electronic circuit provides automaticontrol for liquid nitrogen traps		
LINEAR SYSTEMS		06	KSC-10127  Viscosity and density of methanol/wa	B68-10061 ater	01
ELAS: - A general purpose computer progr for the equilibrium problems of linea structures	ır		mixtures at low temperatures M-FS-14991	B68-10274	03
Conceptual hermetically sealed elbow	3-10187	06	Dual-purpose chamber-cooling system NPD-10467	B68-10506	02
actuator M-FS-14710 B68 LINEARITY	3-10300	05	LIQUID OXIDIZERS Two-fluid, impinging-sheet injector NPO-10547	B68-10338	05
Design techniques - Stochastic controll		02	LIQUID OXYGEN  Device damps fluid pressure oscillation vent valve	tions in	
Dynamic linearity measurement technique KSC-10186 B68		01	M-FS-13290 LIQUID POTASSIUM	B68-10078	05
LINEARIZATION FORTRAN optical lens design program NPO-10603 B68	3-10354	06	Spiral-grooved shaft seals substants reduce leakage and wear LEWIS-10397	B68-10270	05
LININGS Analysis of filament reinforced metal-s	shell		LIQUID PROPELLANT ROCKET ENGINES Nondestructive testing of brazed roc	cket	
	3-10405	06	engine components M-FS-18191	B68-10394	03
LINKAGES Toggle operated double latch MSC-11377 B68	3-10117	05	LIQUID ROCKET PROPELLANTS Flexible ring baffles for damping listosh	•	
LIPOPROTEINS Study of behavior of sterols at interfa		•	LANGLEY-90194 Hydrogen safety manual	B68-10064	05
LIQUID COOLING	3-10281	03	LEWIS-10487 LIQUID SLOSHING	B68-10323	01 .*
	3-10338	05	Flexible ring baffles for damping li slosh LANGLEY-90194	iquid B68-10064	05
Conceptual apparatus for detecting leak nonconductive liquids			Improved technique for digital simul of bending and slosh phenomena		
LIQUID HELIUM		01	M-FS-14788 LIQUID SODIUM	B68-10570	02
Superconductive thin film makes conveni liquid helium level sensor LANGLEY-10289 B68		01	Spiral-grooved shaft seals substanti reduce leakage and wear LEWIS-10397	ially B68-10270	05
LIQUID HYDROGEN Simple test for physical stability of cryogenic tank insulation M-FS-12547 B68	3-10048	03	LIQUID-VAPOR EQUILIBRIUM Real fluid properties of normal and parahydrogen LEWIS-10458	B68-10361	06
Device damps fluid pressure oscillation vent valve M-FS-13290 B68		05	LIQUID-VAPOR INTERFACES  Large-amplitude inviscid fluid motio accelerating container	on in an	
			MSC-11560	B68-10170	20

Dynamics of moving bubbles in sing binary component systems M-FS-14845	le and B68-10339	92	Gimbal angle sensor GSFC-10305 B68-10315	01
H-15-14040	DOO-10009	02	Closed circuit TV system automatically	
LIQUIDS Miniature paint-spray gun for rece	ssed		guides welding arc M-FS-20084 B68-10357	01
areas MSC-13060	B68-10387	05	Short circuit protection for a power	
Dispensing graduate for butadiene	B00-10307	05	Short circuit protection for a power distribution system M-FS-14993 B68-10443	01
NPO-10070	B68-10524	03		
LITERATURE Principles of optical-data process	ina		LONG TERM EFFECTS  Spiral-grooved shaft seals substantially reduce leakage and wear	
techniques	9		LEWIS-10397 B68-10270	05
GSFC-10271	B68-10069	01		
1 TOURS			LONGITUDE	
LITHIUM One-dimensional two-phase reacting	720		Theory of a refined earth model M-FS-14679 B68-10228	02
nonequilibrium performance progra			11 10 14013	٧2
MSC-11780	B68-10376	06	LOOPS	
Lithium-tellurium bimetallic cell	has		Improved phase locked loop receiver GSFC-09561 B68-10008	01
increased voltage ARG-10141	B68-10400	01	Phase-lock loop frequency control and the	
High resolution Ge /Li/ spectromet		01	dropout problem M-FS-13948 B68-10130	01
reduces rate-dependent distortion				
counting rates	200 10/00		LOSSES	
ARG-10144	B68-10420	01	Correction for losses in optical birefringent networks, a concept	
LOAD DISTRIBUTION (FORCES)			M-FS-20088 B68-10571	02
Shock-absorbing caster wheel is si	mple and			
compact			LOW PASS FILTERS	
SAN-10019	B68-10266	05	Design of dissipative linear phase filters M-FS-14698 B68-10572	01
Modified Multhopp lifting surface	loading		M-12-14030 B00-10372	VI.
program			LOW PRESSURE	
LANGLEY-10375	B68-10452	06	Absolute low-pressure calibration system	
1040 #00##			M-FS-13085 B68-10160	02
LOAD TESTS  Shock and vibration response of mu	1+:0+000		LOW TEMPERATURE	
structure	itistage		Fire retardant foams developed to suppress	
M-FS-14972	B68-10353	05	fuel fires	
			ARC-10098 B68-10358	03
LOADING			Cibereless requests enoughing of	
Experiments with ceramic coatings M-FS-18150	B68-10355	03	Fiberglass prevents cracking of polyurethane foam insulation on cryogenic	
			vessels	
LOADS (FORCES)			M-FS-20058 B68-10406	20
Electronic load for testing power			LOW TEMPERATURE BRAZING	
generating devices NPO-10350	B68-10203	01	Manganese-alumina-ceramic glass eliminates	
	200 10200	0.1	rigid controls necessary in bonding metals	
Experiments with ceramic coatings			to ceramics	
M-FS-18150	B68-10355	03	SAN-10012 B68-10204	03
Improved limiter for turn-on curre	nt		LOW TEMPERATURE ENVIRONMENTS	
transient			Superconducting switch permits measurement	
GSFC-10413	B68-10384	01	of small voltages at cryogenic temperatures	
			ARG-90260 B68-10087	01
Internal velocity factors MSC-15002	B68-10403	06	Electrochemical cell has internal resistive	
1100 10002	DOO 10400	00	heater element	
Mass loading effects on vibrated r	ing and		GSFC-10358 B68-10325	01
shell structures			LOW MOVED AND AND AND AND AND AND AND AND AND AN	
M-FS-14979	B68-10532	03	LOW TEMPERATURE TESTS  Dual-purpose chamber-cooling system	
LOCKS (FASTENERS)			NPO-10467 B68-10506	02
Boydbolt, a positive-latch, simple	-release			
fastener			LOW VOLTAGE	
MSC-13061			Solid state high-voltage pulser operates	
	B68-10512	05		
LOGIC	B68-10512	05	with low supply voltage	01
LOGIC Parallel-to-serial biphase-data co		05		01
		05	with low supply voltage M-FS-14034 B68-10308 LUBRICANT TESTS	01
Parallel-to-serial biphase-data co MSC-11600	nverter B68-10241		with low supply voltage M-FS-14034  B68-10308  LUBRICANT TESTS  High-temperature bearing lubricants	
Parallel-to-serial biphase-data co MSC-11600 Fluidic-thermochromic display devi	nverter B68-10241 ce	01	with low supply voltage M-FS-14034 B68-10308 LUBRICANT TESTS	01 05
Parallel-to-serial biphase-data co MSC-11600	nverter B68-10241		with low supply voltage M-FS-14034  B68-10308  LUBRICANT TESTS  High-temperature bearing lubricants	
Parallel-to-serial biphase-data co MSC-11600 Fluidic-thermochromic display devi ERC-10031 LOGIC CIRCUITS	nverter B68-10241 ce B68-10350	01	with low supply voltage M-FS-14034  LUBRICANT TESTS High-temperature bearing lubricants LEWIS-10408  B68-10249  LUBRICATING DILS High-temperature bearing lubricants	05
Parallel-to-serial biphase-data co MSC-11600 Fluidic-thermochromic display devi ERC-10031 LOGIC CIRCUITS Self-correcting, synchronizing rin	nverter	01	with low supply voltage M-FS-14034  LUBRICANT TESTS High-temperature bearing lubricants LEWIS-10408  B68-10249  LUBRICATING DILS	
Parallel-to-serial biphase-data co MSC-11600  Fluidic-thermochromic display devi ERC-10031  LOGIC CIRCUITS Self-correcting, synchronizing rin using integrated circuit devices	nverter	01	with low supply voltage M-FS-14034  LUBRICANT TESTS High-temperature bearing lubricants LEWIS-10408  B68-10249  LUBRICATING DILS High-temperature bearing lubricants LEWIS-10408  B68-10249	05
Parallel-to-serial biphase-data co MSC-11600 Fluidic-thermochromic display devi ERC-10031 LOGIC CIRCUITS Self-correcting, synchronizing rin	nverter	01	with low supply voltage M-FS-14034  LUBRICANT TESTS High-temperature bearing lubricants LEWIS-10408  B68-10249  LUBRICATING DILS High-temperature bearing lubricants	05
Parallel-to-serial biphase-data co MSC-11600  Fluidic-thermochromic display devi ERC-10031  LOGIC CIRCUITS Self-correcting, synchronizing rin using integrated circuit devices M-FS-13901  Digital filter suppresses effects	nverter B68-10241 ce B68-10350 g counter B68-10067 of	01	with low supply voltage M-FS-14034  LUBRICANT TESTS High-temperature bearing lubricants LEWIS-10408  B68-10249  LUBRICATING DILS High-temperature bearing lubricants LEWIS-10408  B68-10249  Dynamic-reservoir lubricating device M-FS-14652  B68-10261	05
Parallel-to-serial biphase-data co MSC-11600  Fluidic-thermochromic display devi ERC-10031  LOGIC CIRCUITS Self-correcting, synchronizing rin using integrated circuit devices M-FS-13901  Digital filter suppresses effects nonstatistical noise bursts on m	nverter B68-10241 ce B68-10350 g counter B68-10067 of ultichannel	01	with low supply voltage M-FS-14034  LUBRICANT TESTS High-temperature bearing lubricants LEWIS-10408  B68-10249  LUBRICATING DILS High-temperature bearing lubricants LEWIS-10408  B68-10249  Dynamic-reservoir lubricating device M-FS-14652  B68-10261  LUBRICATION	05
Parallel-to-serial biphase-data co MSC-11600  Fluidic-thermochromic display devi ERC-10031  LOGIC CIRCUITS Self-correcting, synchronizing rin using integrated circuit devices M-FS-13901  Digital filter suppresses effects	nverter B68-10241 ce B68-10350 g counter B68-10067 of ultichannel	01	with low supply voltage M-FS-14034  LUBRICANT TESTS High-temperature bearing lubricants LEWIS-10408  B68-10249  LUBRICATING DILS High-temperature bearing lubricants LEWIS-10408  B68-10249  Dynamic-reservoir lubricating device M-FS-14652  B68-10261	05

LUBRICATION SYSTEMS SUBJECT INDEX

LUBRICATION SYSTEMS Squeeze-film gas bearing technology			M-FS-14582	B68-10239	05
M-FS-14821	B68-10180	05	Spiral-grooved shaft seals substanti reduce leakage and wear	-	
Dynamic-reservoir lubricating device M-FS-14652	e B68-10261	05	LEWIS-10397	B68-10270	05
LUMINAIRES			Machining technique prevents undercu in tensile specimens LANGLEY-10281	utting B68-10352	05
Superconductive thin film makes con- liquid helium level sensor		0.1			V5
LANGLEY-10289  LUMINESCENCE	B68-10341	01	Method for removing surface-damaged from nickel alloys M-FS-18151	B68-10522	03
Luminescent screen composition for cathode ray tubes				DOO IVOLL	••
ERC-19	B68-10056	01	Method for controlling density and permeability of sintered powdered LEWIS-10393	metals B68-10528	03
Preparation of silver-activated zine thin films			MAGAZINES (SUPPLY CHAMBERS)		
GSFC-10687	B68-10271	03	Versatile impact hand tool M-FS-20140	B68-10371	05
LUMINOSITY Rapid-response, light-exposure conti	rol		MAGNESIUM		
system NPO-10238	B68-10502	01	Laminated sheet composites reinforce modular filament sheet M-FS-14575	ed with B68-10146	03
LUMINOUS INTENSITY Improvement in recording and reading	g		Isotopically pure magnesium îsotope-	-24 is	
holograms ERC-10151	B68-10347	02	prepared from magnesium-24 oxide ARG-10154	B68-10293	02
Laser Doppler gas-velocity instrumed M-FS-20039	B68-10349	02	MAGNESIUM ALLOYS Weld microfissuring in Inconel 718 minimized by minor elements		
Automatic solar lamp intensity cont: system			M-FS-18185	B68-10251	03
XGS-10017 LUMPING	B68-10399	01	Battery-package design provides for cooling and constraint MSC-11839	cell B68-10398	05
Shock and vibration response of mul- structure	tistage		MAGNESIUM OXIDES		
M-FS-14972 Lunar Module	B68-10353	05	Isotopically pure magnesium isotope- prepared from magnesium-24 oxide ARG-10154	-24 is B68-10293	02
Astronaut space suit communication a MSC-12101	antenna B68-10238	01	MAGNET COILS Low-cost, fast-response drive circu		
LUNAR SOIL Thermal conductivity and dielectric	constant		electrómagnetic torque motors LEWIS—10143	B68-10386	01
of silicate materials M-FS-14856	B68-10351	03	MAGNETIC AMPLIFIERS  Method for reducing snap in magnetic	e	
LUNGS Study of radiation effects on mamma	lian cells		amplifiers LEWIS-10388	B68-10388	01
in vitro ARG-10191	B68-10294	02	MAGNETIC CONTROL  Magnetically controlled torque wrend	ch	
<b>M</b>			prevents overtorquing SAN-10002	B68-10209	05
MACH NUMBER			MAGNETIC CORES	100-10209	03
Venturi meter with separable diffuse LEWIS-10483	B68-10295	05	Method for reducing snap in magnetic amplifiers		
MACHINE ORIENTED LANGUAGES HICOV /Newton-Raphson calculus of			LEWIS-10388	B68-10388	01
variation with automatic transver M-FS-14468	salities/ B68-10232	06	MAGNETIC MATERIALS  Training manuals for nondestructive using magnetic particles	testing	<i>ॐ</i>
MACHINE TOOLS Thread cutting with 3-axis N/C mill	ing		M-FS-20187	B68-10391	03
machine LANGLEY-10017	B68-10055	06	MAGNETIC RECORDING Harmonic distortion analyzer speeds	setup of	
Numerical Control Machine Data Manua		á.	magnetic tape recorders GSFC-10198	B68-10254	01
M-FS-14342  Contact-spring forming machine for	B68-10080	05	Method of reducing time base error digital magnetic recorders		0.3
conductor cable receptacles M-FS-20126	B68-10550	05	GSFC-10108	B68-10317	01
MACHINERY Weld microfissuring in Inconel 718			MAGNETIC TAPES Analysis of flutter in tape transpos systems	rt	
minimized by minor elements M-FS-18185	B68-10251	03	M-FS-11970	B68-10027	01
MACHINING Manual of industrial diamonds plus			Computer magnetic tape rehabilitation GSFC-10283	on study B68–10035	05
and grinding criteria for machining superalloys			Magnetic tape transport controlled transducer heads	by	

SUBJECT INDEX MATERIALS HANDLING

GSFC-483	B68-10079	01	M-FS-20140	B68-10371	05
Fully automatic telemetry data proc GSFC-10576	B68-10336	01	MANUALS Static structural analysis of shell structures	-type	
A request-oriented information sele	ection		MSC-11555	B68-10066	03
LEWIS-10255	B68-10451	06	Numerical Control Machine Data Manu M-FS-14342	al B68-10080	05
Long-term data storage and retrieva system, a concept M-FS-14789	B68-10505	01	Manual of industrial diamonds plus and grinding criteria for machini		
MAGNETIZATION			superalloys M-FS-14582	B68-10239	05
Study reveals effect of aluminum or saturation moment of Fe-Ni alloys ARG-90259		03	Hydrogen safety manual LEWIS-10487	B68-10323	01
MAGNETOHYDRODYNAMIC FLOW			Training manuals for nondestructive	testing	
Study of convective magnetohydrody: channel flow			using magnetic particles M-FS-20187	B68-10391	03
ARG-10102	B68-10181	02	Chemistry laboratory safety manual		
MAGNETOSTRICTION Ultrasonic temperature measuring de	evice		available SAN-10030	B68-10419	03
LEWIS-10446	B68-10319	01	Training manual on optical alignmen	ıt	
MAGNETS  Compressible sleeve provides automore centering for grinding or turning			instruments M-FS-20292	B68-10574	02
cylinders SAN-10021	B68-10318	05	MANUFACTURING Effect of surface irregularities on	hellows	
MAGNIFICATION	200 20020		fatigue life M-FS-14480	B68-10229	05
Color-televised medical microscopy MSC-13086	B68-10314	01			0.5
MAINTAINABILITY	D00-10314	01	An investigation of particle mixing gas-fluidized bed		0.5
Maintainability methodology and			ARG-10182	B68-10407	05
maintenance analyses M-FS-14134	B68-10075	05	Conditioning flat conductors for fl conductor cable production M-FS-14914	B68-10429	01
MAINTENANCE Maintainability methodology and			Low cost techniques for fabricating	lobed	
maintenance analyses M-FS-14134	B68-10075	05	bearings LEWIS-10296	B68-10441	05
Tube joint leak repair coupling MSC-15022	B68-10540	05	Environmental test planning, select and standardization aids availabl SAN-10028		06
MAMMALS  Compound equation developed for pos	stnatal		Rocket engine analog simulation		
growth of birds and mammals ARG-10192	B68-10427	04	M-FS-14511	B68-10511	01
MANDRELS	200 2018.	• •	Integrated metal transistor leads GSFC-90536	B68-10518	01
Compressible sleeve provides automocentering for grinding or turning			Vertical boring mill capacity is in	creased	
cylinders SAN-10021	B68-10318	05	M-FS-16196	B68-10530	05
MANGANESE  Manganese-alumina-ceramic glass el			MASS RATIOS Advances in light-gas gun technolog M-FS-14270	ју B68-10288	05
rigid controls necessary in bond to ceramics		0.7	MASS SPECTROMETERS		
SAN-10012	B68-10204	03	Effects of surface preparation on of aluminum alloy weldments	•	
MANGANESE ALLOYS Weld microfissuring in Inconel 718			M-FS-13152	B68-10302	03
minimized by minor elements M-FS-18185	B68-10251	03	MASS SPECTROSCOPY Reliable method for testing gross l	eaks in	
MANIPULATORS	:		semiconductor component packages ERC-10150	B68-10562	01
Portable, high intensity isotopic of source provides increased experi- accuracy			MASS TRANSFER Characteristics of fluidized-packed	i beds	
ARG-90250	B68-10243	02	ARG-10049	B68-10278	03
Improved electromechanical master— manipulator			An investigation of particle mixing gas-fluidized bed		
ARG-10027	B68-10372	05 .	ARG-10182	B68-10407	05
MANOMETERS  Conceptual dead weight device to pressure calibration			MATERIAL ABSORPTION Precise doping of metals by small q LEWIS-10444	jas flows B68-10526	03
M-FS-14672	B68-10264	01	MATERIALS HANDLING		
MANUAL CONTROL  Versatile impact hand tool			Computer magnetic tape rehabilitati GSFC-10283	lon study B68-10035	05

High-temperature bearing-cage mater LEWIS-10403	ials B68-10176	05	NPO-10228	B68-10082	05
Packaging criteria for transportati handling shock and vibration			Monitor senses amount of contaminat deposited on surfaces GSFC-10212	ion B68-10089	01
M-FS-13007	B68-10219	05	Custom for		
Contamination control handbook M-FS-20185	B68-10392	03	System for measuring roundness and concentricity of large tanks M-FS-13362	B68-10099	05
MATERIALS TESTS Survey of fracture toughness test m LEWIS-10379	ethods B68-10046	03	Mm-wave power meter mount NPO-10348	B68-10152	01
MATHEMATICAL MODELS  Design techniques - Stochastic cont  MSC-11554	rollers B68-10234	02	Low energy ohmmeter can be used to sensitive circuits, other meters SAN-10013	B68-10269	01
Vibration testing and dynamic studi	-	UL.	Cryogenic liquid level measuring pr ARG-10138	obe B68-10291	01
relays M-FS-14542	B68-10268	01	Venturi meter with separable diffus LEWIS-10483	er B68-10295	05
Computer graphics data conditioning M-FS-14695	B68-10296	06	High-torque power wrench, a concept M-FS-18194	B68-10299	05
Compound equation developed for pos	tnatal				
growth of birds and mammals ARG-10192	B68-10427	04	Modified sine bar device measures s angles with high accuracy GSFC-438	mall B68-10322	02
Rocket engine analog simulation M-FS-14511	B68-10511	01	Automatic, nondestructive test moni in-process weld quality	tors	
Improved technique for digital simu	lation		M-FS-14996	B68-10333	01
of bending and slosh phenomena M-FS-14788 MATRICES	B68-10570	02	Superconductive thin film makes con liquid helium level sensor		
One hundred angstrom niobium wire			LANGLEY-10289	B68-10341	01
LEWIS-10128 MATRICES (CIRCUITS)	B68-10279	03	Determining gas leakage from bubble formations M-FS-14841	B68-10393	05
Random access-random release relay				200 10000	••
switching matrix M-FS-12590	B68-10301	01	Battery-package design provides for cooling and constraint MSC-11839	cell B68-10398	05
Short circuit protection for a powe	r		0	L	
distribution system M-FS-14993	B68-10443	01	System for measuring spatial distri ejected droplets, a concept NPD-10185	B68-10402	01
Locating **sneak paths** in electri circuitry M-FS-15018	B68-10565	01	Nosepiece respiration monitor ERC-10136	B68-10438	01
MATRICES (MATHEMATICS)  MOP /Matrix Operation Programs			Low friction servo valve LEWIS-10574	B68-10440	05
system/ NPO-10429	B68-10005	06	Environmental test planning, select	ion	
Solution of differential equations application of transformation gro	ру		and standardization aids availabl SAN-10028		06
M-FS-14802  Linear systems of equations solved	B68-10276	02	MECHANICAL DRIVES  Remotely operated gripper provides  control rod movement	vertical	
mathematical algorithms	ao i ny		ARG-10160	B68-10359	05
ARG-10146	B68-10292	06			- Gar
Controllability of distributed-para systems			High-torque precision stepping driv	B68-10549	<i>.</i> ≱ 05
M-FS-14929 MATRIX METHODS	B68-10346	02	MECHANICAL PROPERTIES Study of mechanical properties of u compounds		
Shock and vibration response of mul structure	tistage		ARG-10074	B68-10197	03
M-FS-14972	B68-10353	05	Ignition of binary alloys of uraniu ARG-10057	m B68-10280	01
MCLEOD GAGES Absolute low-pressure calibration s M-FS-13085	ystem B68-10160	02	Fiberglass-reinforced structural ma for aerospace application M-FS-14806	terials B68-10360	03
MEAN FORTRAN optical lens design program NPO-10603	B68-10354	06	Tungsten fiber-reinforced nickel su LEWIS-10424	peralloy B68-10369	03
MEASURING INSTRUMENTS Digital data averager improves conv			Nickel-base superalloy*s excellent properties promote its service to	2200	
measurement system performance MSC-12078	B68-10018	01	degrees F LEWIS-10355	B68-10380	03
Deployable lattice column			Weld joint strength and mechanical	properties	

	•			
in 2219-T81 aluminum alloy LEWIS-10479	B68-10561	03	METAL OXIDE SEMICONDUCTORS  Two-way digital driver/receiver uses one set of lines	
MECHANICAL SHOCK Reliable, self-calibrating vibration	on		ERC-10055 B68-1	10437 01
transducer LANGLEY-89	B68-10124	01	Integrated metal transistor leads GSFC-90536 B68-1	10518 01
MECHANIZATION  Development of mechanized ultrason	ic		METAL PARTICLES Training manuals for nondestructive testi	i na
scanning system M-FS-13638	B68-10004	05	using magnetic particles	10391 03
MEDICAL ELECTRONICS Electrocardiograph transmitted by			METAL POWDER Electron beam selectively seals porous me	etal
telephone links in emergency sit FRC-10031	B68-10233	01	filters LEWIS-10162 B68-1	10331 05
MEDICAL EQUIPMENT Automated patient monitoring system			Grain growth inhibitor for porous tungste materials	
M-FS-14552	B68-10131	.01	LEWIS-10535 B68-1	10527 03
Instrumentation for bone density m MSC-11388	easurement B68-10140	01	Method for controlling density and permeability of sintered powdered metal LEWIS-10393 B68-1	ls 10528 03
Cardiac R-wave detector LEWIS-10394	B68-10144	01	METAL SHEETS Weld joint strength and mechanical proper	rties
New electrical plethysmograph moni cardiac output			in 2219-T81 aluminum alloy	10561 03
MSC-11447	B68-10220	01	METAL SHELLS	
Color-televised medical microscopy MSC-13086	B68-10314	01	Analysis of filament reinforced metal-she pressure vessels LEWIS-10352 B68-1	ell 10405 06
MEMBRANE STRUCTURES Study of behavior of sterols at in	terfaces		METAL STRIPS	10400 00
ARG-10085 MEMORY	B68-10281	03	Inspection criteria ensure quality contro of parallel gap soldering M-FS-14630 B68-1	ol 10257 05
Random access-random release relay				10257 05
switching matrix M-FS-12590	B68-10301	01	METAL SURFACES  Effects of surface preparation on quality  of aluminum alloy weldments	A
MERCURY (METAL)  Low energy chmmeter can be used to	test			10302 03
sensitive circuits, other meters SAN-10013	B68-10269	01	METAL VAPORS Miniaturized King furnace permits	
Random access-random release relay switching matrix			absorption spectroscopy of small sample ARG-10177 B68-1	10418 02
M-FS-12590	B68-10301	01	METAL WORKING Magnetic forming studies	
METABOLISM Study of behavior of sterols at in	terfaces		M-FS-14217 B68-1	10186 02
ARG-10085 METAL BONDING	B68-10281	03	METALLIZING  Manganese-alumina-ceramic glass eliminate  rigid controls necessary in bonding me	
Integrated metal transistor leads GSFC-90536	B68-10518	01	to ceramics	10204 03
METAL COATINGS	000-10010	01	METALLURGY	10204 03
Electron beam selectively seals po	rous metal		An investigation of particle mixing in a gas-fluidized bed	
LEWIS-10162	B68-10331	05		10407 05
METAL COMBUSTION Rapid-response, light-exposure con	trol		METALS  Detection and location of metallic objection	ts
system NPO-10238	B68-10502	01	imbedded in nonmetallic structures M-FS-14790 B68-:	10183 01
METAL DRAWING One hundred angstrom niobium wire			Resistivity measurements of neutron-irradiated pure metals and Al-:	Zn
LEWIS-10128	B68-10279	03	alloys ARG-10108 B68-	10200 03
METAL FATIGUE Predicting fatigue life of metal b	ellows		Nondestructive method for measuring resid	dual
M-FS-14096	B68-10026	05	stresses in metals, a concept KSC-10237 B68-	10378 03
Effect of surface irregularities o fatigue life M-FS-14480	n bellows B68-10229	05	Electromotive series established for meta	als
METAL-METAL BONDING	D00-10229	υĐ	used in aerospace technology M-FS-18327 B68-:	10385 03
Mechanical shielding reduces weld cracking in 6061 T6 aluminum	surface		METASTABLE STATE Microprobe investigation of brittle	
MSC-11494	B68-10022	05	segregates in aluminum MIG and TIG weld	ds 10334 03

METEGROID HAZARDS . SUBJECT INDEX

METEOROID HAZARDS' Advances in light-gas gun technolog M-FS-14270	Jy B68-10288	05	Electrolytic silver ion cell steril water supply MSC-11827	izes B68-10555	01
METEOROLOGY Computer graphics data conditioning	3		MICROPARTICLES Vacuum probe sampler removes micron	-sized	
M-FS-14695 METHYL ALCOHOLS	B68-10296	06	particles from surfaces SAN-10003	B68-10231	04
Viscosity and density of methanol/v mixtures at low temperatures M-FS-14991	B68-10274	03	MICROPHONES  Electrocardiograph transmitted by R  telephone links in emergency situ  FRC-10031		01
Nitric acid-organic mixtures survey use in separation by anion exchar	nge methods		Improved communication system for l		U.
ARG-10065	B68-10425	03	operations center M-FS-15016	B68-10529	01
Coolants with selective optical file characteristics for ruby laser and M-FS-20188		02	MICROSCOPES Preparing rock powder specimens of controlled size distribution		
MICA Electro-optic modulator for infrare			NPO-10007	B68-10297	05
using gallium arsenide crystal : GSFC-10686	B68-10255	02	MICROSCOPY  Color-televised medical microscopy  MSC-13086	B68-10314	01
MICHELSON INTERFEROMETERS System converts optical phase chang	ges to		A rapid stress-corrosion test for a	luminum	
RF phase changes M-FS-20091	B68-10430	01	alloys M-FS-20175	B68-10536	03
MICROANALYSIS Microprobe investigation of brittle			MICROSTRUCTURE Pre-weld heat treatment improves we	lds in	
segregates in aluminum MIG and TI M-FS-14720	B68-10334	03	Rene 41 M-FS-18174	B68-10285	03
Imaging slitless spectrometer for ) astronomy M-FS-14309	-	0.0	Grain-boundary migration in KCl bic ARG-10181	rystals B68-10455	03
MICROBIOLOGY	B68-10546	02	Grain growth inhibitor for porous t materials	ungsten	
A microlagoon technique for the cul	lture of		LEWIS-10535	B68-10527	03
LANGLEY-10407	B68-10554	04	MICROWAVE AMPLIFIERS Power consumption in acoustic ampli		
MICROELECTRONICS  Piggy-back mounting would increase microcircuit packaging density			under conditions of maximum stabl GSFC-10067	e gain B68-10327	01
MSC-12059  High dielectric thick films for sc	B68-10114	01	MICROWAVE ANTENNAS Feasibility study of wireless power transmission systems		
circuit capacitors LANGLEY-10294	B68-10542	01	M-FS-14691	B68-10309	01
MICROFILMS Long-term data storage and retrieva	a l		MICROWAVE RESONANCE Improved atomic resonance gas cell in frequency standards	for use	
system, a concept M-FS-14789	B68-10505	01	MSC-11666	B68-10230	01
MICROINSTRUMENTATION  Measuring thermal expansion of mult	tinle		MICROWAVE TRANSMISSION  Feasibility study of wireless power  transmission systems		
specimens at high temperature	B68-10122	05	M-FS-14691	B68-10309	01
MICROMETEOROIDS Advances in light-gas gun technolog			MICROWAVES Improved traveling wave maser ampli NPO-10548	fier B68-10244	01
M-FS-14270	B68-10288	05	Feasibility study of wireless power		<i>₹</i>
MICROMINIATURIZATION Gyrator-type circuits replace ungre inductors	ounded		transmission systems M-FS-14691	B68-10309	01
XAC-10608  Inspection criteria ensure quality	B68-10084	01	MILLIMETER WAVES  Mm-wave power meter mount  NPO-10348	B68-10152	01
of parallel gap soldering M-FS-14530	B68-10257	05	MILLING (MACHINING)		
Standards for compatibility of principle circuit and component lead mater			High temperature alloy LEWIS-10377	B68-10253	03
M-FS-14531 MICROMINIATURIZED ELECTRONIC DEVICES	B68-10310	01	Preparing rock powder specimens of controlled size distribution NPO-10007	B68-10297	05
New microelectronic power amplified M-FS-13621	r B68-10073	01	Machining technique prevents underc	•	
MICROORGANISMS			in tensile specimens LANGLEY-10281	B68-10352	05
Vacuum probe sampler removes micro particles from surfaces SAN-10003	B68-10231	04	Vertical boring mill capacity is in M-FS-16196	creased B68-10530	05

MILLING MACHINES  Fast method for obtaining scale dime on tape-controlled milling machine			of welded cordwood electronic modu LEWIS-90339	les B68-10063	01
	B68-10047	05	Improved molding process ensures pla parts of higher tensile strength	stic	
Thread cutting with 3-axis N/C milli machine	ng	,2		B68-10132	05
LANGLEY-10017 MINERAL OILS	B68-10055	06	Standards for compatibility of print circuit and component lead materia M-FS-14531		01 .
High-temperature bearing lubricants LEWIS-10408	B68-10249	05	Compressible sleeve provides automat centering for grinding or turning		
MINERALOGY Preparing rock powder specimens of			cylinders SAN-10021	B68-10318	05
controlled size distribution NPO-10007	B68-10297	05	MOLECULAR STRUCTURE The thermodynamic properties of the	wnatito	
MINIATURE ELECTRONIC EQUIPMENT Silicon strain sensors enable pressu			phase are studied	B68-10408	03
	B68-10262	01	The preparation, identification and properties of chlorophyll derivati	ves	e.
MINIATURIZATION			ARG-10205	B68-10409	03
Miniature pressure transducer for st member application	ressed		MOLTEN SALT ELECTROLYTES		
MSC-11869	B68-10246	01	Lithium-tellurium bimetallic cell ha increased voltage		
High-speed pulse camera MSC-11353	B68-10329	02	ARG-10141 MOLYBDENUM	B68-10400	01
Cooled miniature pressure transducer	·s		Lightweight heater generates high		
effective at high temperatures	B68-10370	01	temperatures from low current	B68~10223	01
Miniature paint-spray gun for recess	ad		Graphite cloth facilitates vacuum		
areas	B68-10387	05	evaporation of silicon monoxide	B68-10256	03
MIDDODO					
MIRRORS Improved gas ring laser			Nickel base alloy with improved stre rupture properties	.ss	
	B68-10304	02		B68-10344	03
Color-televised medical microscopy MSC-13086	B68-10314	01	MOLYBDENUM ALLOYS High temperature alloy LEWIS-10377	B68-10253	03
Modified sine bar device measures sm	all		NOT VANDALISM DECUE PERSON		
angles with high accuracy GSFC-438	B68-10322	02	MOLYBDENUM DISULFIDES One hundred angstrom niobium wire LEWIS-10128	B68-10279	03
UV detector monitors organic contami	nation				
of optical surfaces M-FS-20246	B68-10413	01	Application of the solid lubricant molybdenum disulfide by sputtering LEWIS-10544	B68-10340	03
MITOSIS				D00-10040	00
Study of radiation effects on mammal in vitro	Tan Cells		MOMENTS  Computer program analyzes and design	ıs ·	
	B68-10294	02	supersonic wing-body combinations	B68-10335	06
MIXING Two-fluid, impinging-sheet injector NPO-10547	B68-10338	05	MOMENTUM Axisymmetric two-phase perfect gas		
An investigation of particle mixing gas-fluidized bed	in a		performance program MSC-11774	B68-10374	06
ARG-10182	B68-10407	05	MOMENTUM TRANSFER Advances in light-gas gun technology	1	
MOBILITY			M-FS-14270	B68-10288	05
Improved electromechanical master-sl manipulator	ave		MONITORS		
ARG-10027	B68-10372	05	Gage monitors quality of cross-wire resistance welds		
MODAL RESPONSE  Computer program determines vibration				B68-10002	01
three-dimensional space of hydraul excited by forced displacements M-FS-12226	ic lines B68-10159	06	Monitor senses amount of contaminati deposited on surfaces GSFC-10212	on B68-10089	01
MODE TRANSFORMERS Improved gas ring laser			Automated patient monitoring system M-FS-14552	B68-10131	01
MSC-11584	B68-10304	02	Deflection circuit monitors force on		-
MODULATORS Electro-optic modulator for infrared	l laser		under water	B68-10147	01
using gallium arsenide crystal GSFC-10686	B68-10255	02	Silicon solar cell monitors high tem	perature	
MOLDS Plastic preforms facilitate fabricat	ion		furnace operation NUC-10163	B68-10148	01

## SUBJECT INDEX

New electrical plethysmograph monitor	ors		LEWIS-10437	B68-10382	01
cardiac output MSC-11447	B68-10220	01	A 35 GHz solid state transmitter/dr M-FS-20152	iver B68-10545	01
Vacuum probe sampler removes micron- particles from surfaces			MULTISTAGE ROCKET VEHICLES		
SAN-10003	B68-10231	04	Shock and vibration response of mul structure	_	
Recharge unit provides for optimum recharging of battery cells GSFC-10688	96910277	01	M-FS-14972	B68-10353	05
Automatic, nondestructive test moni	B68-10273	O.T.	MULTIVIBRATORS One-shot pulse shaper circuit XGS-11379	B68-10012	01
in-process weld quality M-FS-14996	B68-10333	01	N .	200 100-	-
Automatic system nondestructively m	onitors		NETWORK ANALYSIS		
and records fatigue crack growth LANGLEY-10091	B68-10379	01	GERT EXCLUSIVE-OR combining paths a loops of electrical networks		
Compact monitoring and control cons	ole for		ERC-10206	B68-10435	06
pressurized gas bottles M-FS-14874	B68-10401	05	Performance analysis of electrical /PANE/	circuits	
Nosepiece respiration monitor			M-FS-15001	B68-10448	06
ERC-10136	B68-10438	01	GERT simulation program for GERT ne		
NOSTABLE MULTIVIBRATORS Automatic patient respiration failu			ERC-10209	B68-10457	06
detection system with wireless tr ARC-10174	ansmission B68-10365	01	Locating **sneak paths** in electri circuitry		
NTE CARLO METHOD			M-FS-15018	B68-10565	01
Deep gamma ray penetration in thick M-FS-14388	shields B68-10143	02	NETWORK SYNTHESIS  Active RC networks of low sensitivi integrated circuit transfer funct		
Performance analysis of electrical /PANE/			synthesis ARC-10146	B68-10210	01
M-FS-15001	B68-10448	06	Technique developed for measuring		
SAICS Selective video blanking technique M-FS-20013	B68-10434	01	transmittance of optical birefrin networks M-FS-14267	gent B68-10260	02
TORS	200 10.0.	<b>V</b> 2			••
Conceptual hermetically sealed elbo actuator	<b>w</b>		Study of optimum discrete estimator measurement analysis M-FS-14915	B68-10348	02
M-FS-14710	B68-10300	05	GERT EXCLUSIVE-OR combining paths a		02
UNTING Piggy-back mounting would increase			loops of electrical networks ERC-10206	B68-10435	06
microcircuit packaging density MSC-12059	DC0 10114	0.1		200 10100	•
Gimbal angle sensor	B68-10114	01	NEUTRON ABSORBERS  Portable, high intensity isotopic n source provides increased experim		
GSFC-10305	B68-10315	01	accuracy ARG-90250	B68-10243	02
UTH Experimental study and evaluation o	f		NEUTRON ACTIVATION ANALYSIS	2.7 2.7.1	
radioprotective drugs ARG-10196	B68-10320	04	Detection sensitivities in 3-8 MeV neutron activation		
LTICHANNEL COMMUNICATION			ARG-10210	B68-10298	02
Multichannel implantable telemetry ARC-10083	system B68-10065	01	NEUTRON COUNTERS  Detection sensitivities in 3-8 MeV		
Diversity RF receiving system with			neutron activation ARG-10210	B68-10298	02 02
improved phase-lock characteristi XGS-01222	cs B68-10068	01	NEUTRON IRRADIATION		
LTIPLICATION			Procedure developed for reporting fast-neutron exposure		
Improved electromechanical master-s manipulator	lave		ARG-10035	B68-10190	02
ARG-10027	B68-10372	05	Resistivity measurements of neutron-irradiated pure metals an	d Al-Zn	
ILTIPLIERS Improved dc voltage multiplier			alloys ARG-10108	B68-10200	03
M-FS-14042	B68-10074	01	NEUTRON SCATTERING		
Conceptual hermetically sealed elbo actuator	w		Isotopically pure magnesium isotope prepared from magnesium-24 oxide		
M-FS-14710	B68-10300	05	ARG-10154	B68-10293	02
System measures arc energy dissipat relay contact cycling	ed in		NEUTRON SOURCES Portable, high intensity isotopic m	eutron	
M-FS-14541	B68-10312	01	source provides increased experim accuracy	ental	
System measures response time of photomultiplier tubes			ARG-90250	B68-10243	02
· •					

NEUTRON SPECTRA			LEWIS-10128	B68-10279	03
Low scatter lightweight fission spec constructed for biological researc	h		Superconductive thin film makes con-	venient	
ARG-10094	B68-10174	02	liquid helium level sensor LANGLEY-10289	B68-10341	01
NEUTRON SPECTROMETERS Four pi-recoil proportional counter	used as	,	Nickel-base superalloy*s excellent		
neutron spectrometer ARG-10101	B68-10326	02	properties promote its service to degrees F	2200	
NEWTON-RAPHSON METHOD			LEWIS-10355	B68-10380	03
Computer program offers new method is constructing periodic orbits in no dynamical systems			High-emittance coatings on metal su LEWIS-10325	bstrates B68-10381	03
M-FS-14654	B68~10217	06	Inverted grounding technique for el	ectron	
HICOV /Newton-Raphson calculus of variation with automatic transvers	1:4:/		beam heating LEWIS-10543	B68-10411	01
M-FS-14468	B68~10232	06	NIOBIUM ALLOYS		
NEWTON THEORY Real fluid properties of normal and			Application of the solid lubricant molybdenum disulfide by sputterin LEWIS-10544	g B68-10340	03
parahydrogen LEWIS-10458	B68-10361	06	NITRIC ACID		
NICHROME (TRADEMARK)			Nitric acid-organic mixtures survey use in separation by anion exchan		
Viscosity and density of methanol/wa mixtures at low temperatures	ater		ARG-10065	B68-10425	60
M-FS-14991	B68-10274	03	NITROGEN	tion of	
NICKEL			High-pressure gas facilitates calib turbine flowmeters for liquid hyd	rogen	
Nickel base alloy with improved stre rupture properties	288		LEWIS-10402	B68~10145	01
LEWIS-10283 NICKEL ALLOYS	B68-10344	03	Manganese-alumina-ceramic glass eli rigid controls necessary in bondi to ceramics		
High strength nickel-base alloy with improved oxidation resistance up			SAN-10012	B68~10204	03
degrees F		03	High-voltage pulse generator develo	ped for	
LEWIS-10115	B68-10094	03	wide-gap spark chambers ARG-10136	B68-10283	01
Study reveals effect of aluminum on saturation moment of Fe-Ni alloys ARG-90259	B68-10172	03	Cryogenic liquid level measuring pr ARG-10138	obe B68-10291	01
Weld microfissuring in Inconel 718			One-dimensional reacting gas nonequ	ilibrium	
minimized by minor elements M-FS-18185	B68-10251	03	performance program MSC-11777	B68-10375	06
Inspection criteria ensure quality of parallel gap soldering	control		One-dimensional two-phase reacting nonequilibrium performance progra		
M-FS-14530	B68-10257	05	MSC-11780	B68-10376	06
Pre-weld heat treatment improves we	lds in		Axisymmetric reacting gas nonequili	brium	
Rene 41 M-FS-18174	B68-10285	03	performance program MSC-11781	B68-10377	06
Ultrasonic temperature measuring de LEWIS-10446	vice B68-10319	01	Titanium-nitrogen reaction investig application to gettering systems	ated for	
Tungsten fiber-reinforced nickel su	nerallov		ARG-10208	B68-10414	03
LEWIS-10424	B68-10369	03	NOISE Simultaneous message framing and er	ror	
Nickel-base superalloy*s excellent properties promote its service to	2200		detection MSC-12001	B68-10330	01
degrees F LEWIS-10355	B68-10380	03	NOISE (SOUND)  Noise figure measurement concept fo	.=	
Method for removing surface-damaged from nickel alloys	layers		acoustic amplifiers GSFC-10066	B68-10272	01
M-FS-18151	B68-10522	03	NOISE METERS		
NICKEL CADMIUM BATTERIES Charge control of nickel-cadmium ba	tteries		Improved S/N meter MSC-11656	B68-10151	01
by coulometer and third electrode GSFC-10487		01	NOISE REDUCTION		
	DOC 10401	VI.	Digital filter suppresses effects o		
NICKEL COMPOUNDS Application of the solid lubricant			nonstatistical noise bursts on mu scaler digital averaging systems		
molybdenum disulfide by sputtering LEWIS-10544	g B68-10340	03	ARG-90143	B68-10193	06
NIOBATES			NONDESTRUCTIVE TESTS  Dc pin-to-pin testing of integrated		
Improved process for making thin-fi niobate capacitors	lm sodium		circuits GSFC-10284	B68-10001	01
MSC-11231	B68-10163	01			01
NIOBIUM			Gage monitors quality of cross-wire resistance welds		
One hundred angstrom niobium wire			GSFC-90549	B68-10002	01

Development of mechanized ultrason scanning system M-FS-13638	B68-10004	05	NONUNIFORMITY  Bimetal sensor averages temperature nonuniform profile LEWIS-10362	of B68-10007	01
Evaluation of methods for nondestrutesting of brazed joints ARG-90175	B68-10191	03	NORMAL DENSITY FUNCTIONS Computer program determines exact tw tolerance limits for normal distri	butions	
Standards for compatibility of principles of circuit and component lead mater: M-FS-14531		01	M-FS-18045  Application of a truncated normal fa		06
Automatic, nondestructive test moni in-process weld quality M-FS-14996	itors B68-10333	01	M-FS-14328 NOTCH TESTS	B68-10179	02
Nondestructive test determines over destruction characteristics of co limiter fuses	rload		Effect of surface irregularities on fatigue life	bellows B68-10229	05
XGS-08566	B68-10364	01	NOZZLE FLOW Axisymmetric two-phase perfect gas		
Nondestructive method for measuring stresses in metals, a concept KSC-10237	g residual B68-10378	03	performance program MSC-11774	B68-10374	06
Automatic system nondestructively and records fatigue crack growth			One-dimensional two-phase reacting g nonequilibrium performance program MSC-11780		06
LANGLEY-10091 Training manuals for nondestructive	B68-10379 e testing	01	NOZZLE GEOMETRY Venturi meter with separable diffuse		
using magnetic particles M-FS-20187	B68-10391	03	LEWIS-10483  One-dimensional reacting gas nonequi	B68-10295	05
Nondestructive testing of brazed ro engine components M-FS-18191	B68-10394	03	performance program	B68-10375	06
Hydrostatic testing of porous asser M-FS-18298		05	One-dimensional two-phase reacting g nonequilibrium performance program MSC-11780		06
Rocket engine analog simulation M-FS-14511	B68-10511	01	Axisymmetric reacting gas nonequilib performance program MSC-11781	orium B68-10377	06
Failure rates for accelerated acce testing of silicon transistors ERC-10198	B68-10541	01	NOZZLES Miniature paint-spray gun for recess	ed	
NONEQUILIBRIUM CONDITIONS ELAS - A general purpose computer process for the equilibrium problems of the control			areas MSC-13060 System for measuring spatial distrib	B68-10387	05
structures NPO-10598	B68-10187	06	ejected droplets, a concept	B68-10402	01
One-dimensional reacting gas noneque performance program MSC-11777	1111brium B68-10375	06	NUCLEAR EXPLOSIONS Rapid-response, light-exposure contr system		
Axisymmetric reacting gas nonequil performance program			NUCLEAR FUEL ELEMENTS	B68-10502	01
MSC-11781 NONEQUILIBRIUM FLOW	B68-10377	06	Glassy materials investigated for nu reactor applications ARG-10075	B68-10103	03
One-dimensional two-phase reacting nonequilibrium performance progra MSC-11780		06 .	NUCLEAR FUELS  Technological survey of tellurium an compounds	nd its	¥.
NONLINEAR EQUATIONS Solution of differential equations application of transformation gro			ARG-10119  Characteristics of fluidized-packed	B68-10201	03
M-FS-14802	B68-10276	02	ARG-10049	B68-10278	03
NONLINEAR SYSTEMS  Computer program offers new method constructing periodic orbits in a dynamical systems			Consolidation and fabrication techni for vanadium-20 w/o titanium /TV-2 ARG-10148		03
M-FS-14654  NONLINEARITY  New technique for optimal smoothing MSC-11354	B68-10217 g of data B68-10060	06	NUCLEAR MAGNETIC RESONANCE The preparation, identification and properties of chlorophyll derivati ARG-10205	ves B68-10409	03
Vibration testing and dynamic stud relays M-FS-14542		01	NUCLEAR PHYSICS Ignition of binary alloys of uranium ARG-10057	1 · B68-10280	01
Low-cost, fast-response drive circ electromagnetic torque motors LEWIS-10143		01	NUCLEAR POWER REACTORS Electronic calorimetric computer LEWIS-90254	B68-10138	01

NUCLEAR REACTIONS			ARG-10192	B68-10427	04
An economical method for the continuous production of iodine-123	nona		NUTRITIONAL REQUIREMENTS		
LEWIS-10518	B68-10433	03	Food products for space applications		
NUCLEAR REACTORS			MSC-11697	B68-10324	04
Glassy materials investigated for no	uclear		NUTS (FASTENERS)		
reactor applications	200 10107	0.7	Tensile testing grips ensure uniform	n loading	
ARG-10075	B68-10103	03	of bimetal tubing specimens LEWIS-10267	B68-10248	05
Steady-state differential calorimete					
measures gamma heating in reactor ARG-10120	B68-10182	01	High-torque power wrench, a concept M-FS-18194	B68-10299	05
		••			•-
Portable, high intensity isotopic no					
source provides increased experimacuracy	entai		O RING SEALS		
ARG-90250	B68-10243	20	Cooled miniature pressure transduce	rs	
NUCLEAR ROCKET ENGINES			effective at high temperatures LEWIS-10401	B68-10370	01
Ultrasonic temperature measuring de	vice				
LEWIS-10446	B68-10319	01	OCEANOGRAPHY  New method for critical failure pre-	diction	
NUCLEATE BOILING		*	of complex systems		
Evaluation of superconducting magne	ts, a		M-FS-14133	B68-10252	02
study M-FS-14808	B68-10396	02	Computer graphics data conditioning		
			M-FS-14695	B68-10296	06
NUCLEATION  Analytical techniques for determini	na boron		Charts designate probable future		
in graphite	-		oceanographic research fields		
ARG-10087	B68-10102	03	M-FS-20202	B68-10397	01
Electron beam recrystallization of	amorphous		Analysis of filament reinforced met	al-shell	
semiconductor materials	Dec 10556	02	pressure vessels LEWIS-10352	B68-10405	06
LEWIS-10443	B68-10556	02	LEW15-10352	D00-10403	UU
NUCLEI			OILS	lasha ae	
Stratification of centrifuged amoeb investigated by electron microsco			Conceptual apparatus for detecting nonconductive liquids	leaks of	
ARG-10161	B68-10366	04	M-FS-14713	B68-10303	01
NUCLEI (NUCLEAR PHYSICS)			ON-LINE PROGRAMMING		
Four pi-recoil proportional counter	used as		Computer graphics data conditioning		
neutron spectrometer	B68-10326	02	M-FS-14695	B68-10296	06
ARG-10101	B00-10020	UZ	ONE DIMENSIONAL FLOW	,	
NUMERICAL ANALYSIS			One-dimensional reacting gas nonequ	ilibrium	
Large-amplitude inviscid fluid moti accelerating container	on in an		performance program MSC-11777	B68-10375	06
MSC-11560	B68-10170	02	CDCDAMANA BUMDEDA WIDE		
Computer program determines system			OPERATING TEMPERATURE Liquid crystal calibrator		
stability /DIGSTA/			M-FS-14151	B68-10221	03
LEWIS-10395	B68-10216	06	OPERATIONAL PROBLEMS		
NUMERICAL CONTROL			Electrochemical cell has internal r	esistive	
Thread cutting with 3-axis N/C mill machine	ing		heater element GSFC-10358	B68-10325	01
LANGLEY-10017	B68-10055	06	0510 10000	500 10050	٠.
Warner I don't all Warles Date Warner	_ 1		OPTICAL COMMUNICATION  Site survey for optimum location of	Ontion	
Numerical Control Machine Data Manu M-FS-14342	B68-10080	05	Communication Experimental Facili		
			M-FS-13155	B68-10050	06
Accurate digital technique simulate control system	s 111gnt		Repetitively pulsed, wavelength-sel	ective	
M-FS-14787	B68-10569	02	carbon dioxide laser		
NUMERICAL INTEGRATION			ERC-10178	B68-10564	02
Computer program determines exact t			OPTICAL EQUIPMENT	_	
tolerance limits for normal distr M-FS-18045	·ibutions 868-10158	06	Optical system facilitates inspecti printed circuit boards	on of	•
11 15 15045	200 2020		GSFC-07971	B68-10021	02
Computer program analyzes Buckling Shells Of Revolution with various			Antiglare improvement for optical i	maaina	
construction, BOSOR	wall		systems	adging	
LANGLEY-10290	B68-10226	06	NPO-10337	B68-10090	02
CIRCUSA digital computer program	for		Circuit enhances vertical resolution	n in	
transient analysis of electronic	circuits	0.0	raster scanning systems		
M-FS-15002	B68-10416	06	MSC-12123	B68-10121	01
NUTRITION			Optical integrating sphere operates	at .	
Experimental study and evaluation of radioprotective drugs	) I		visible and infrared wavelengths M-FS-14248	B68-10126	02
ARG-10196	B68-10320	04		<b></b>	
Compound equation developed for pos	etnatal		Improved relay optical element for spectroradiometer using cryogenic	:allv	
growth of birds and mammals			cooled detector		

	MSC-11688  Modified sine bar device measures s	B68-10245	02	HICOV /Newton-Raphson calculus of variation with automatic transver M-FS-14468	salities/ B68-10232	06
	angles with high accuracy GSFC-438	B68-10322	02	Silicon strain sensors enable press	ure	VO
	FORTRAN optical lens design program NPO-10603	B68-10354	06	measurement at cryogenic temperat M-FS-14703	ures B68-10262	01
				Computer program analyzes and desig	ns	
	Training manual on optical alignmen instruments M-FS-20292	t B68-10574	02	supersonic wing-body combinations ARC-10141		06
	. 15 5055	DOG 10074	02	Study of optimum discrete estimator	s in	
OF	TICAL MEASUREMENT Improved optical diffractometer	7.00 4.0.00		measurement analysis M-FS-14915	B68-10348	02
	MSC-12055	B68-10071	02	FORTRAN option! long docing program		
OF	TICAL MEASURING INSTRUMENTS Optimetric system facilitates color	imetric		FORTRAN optical lens design program NPO-10603	B68-10354	06
	and fluorometric measurements NPO-10233	B68-10316	01	Single degree of freedom antenna po program /ANTENA/ NPO-10756	inting B68-10449	06
	Detection of effect of deposits on windows of pyrometer measurements			Computer program for parameter	D00-10449	06
	LEWIS-10366	B68-10367	01	optimization		
	TICAL MICROSCOPES			ARC-10168	B68-10453	06
U	Color-televised medical microscopy MSC-13086	B68-10314	01	Radial inflow turbine design charts LEWIS-10720	B68-10567	05
ΩE	TICAL PROPERTIES			ORBITAL MECHANICS		
Ű.	Properties of optics at high temper	ature and		Generalized Newton-Raphson trajecto	rv	•
	their measurement, a study			optimization-generator 1	•	
	M-FS-14696	B68-10240	02	M-FS-15020	B68-10422	06
	UV detector monitors organic contam	ination		ORBITAL RENDEZVOUS		
	of optical surfaces			Generalized Newton-Raphson trajecto	ry	
	M-FS-20246	B68-10413	01	optimization-generator 1	D.C. 10/00	
	Correction for losses in optical			M-FS-15020	B68-10422	06
	birefringent networks, a concept M-FS-20088	B68-10571	02	ORBITAL SPACE STATIONS Feasibility study of wireless power		
OF	TICAL REFLECTION			transmission systems M-FS-14691	B68-10309	01
	Improved electro-optical tracking s					
	M-FS-14791	B68-10311	01	ORBITS Computer program offers new method	for	
OF	TICAL TRACKING			constructing periodic orbits in n		
	Improved electro-optical tracking s M-FS-14791	ystem B68-10311	01	dynamical systems M-FS-14654	B68-10217	06
OF	TICS			ORGANIC COMPOUNDS		
	New camera tube improves ultrasonic			Nitric acid-organic mixtures survey	ed for	
	inspection system ARG-90237	B68-10088	01	use in separation by anion exchan ARG-10065	ge methods B68-10425	03
	Properties of optics at high temper their measurement, a study	ature and		ORIFICES Pressure variable orifice for hydra	ulic	
	M-FS-14696	B68-10240	02	control valve		
	Improved relay optical element for			MSC-11323	B68-10120	05
	spectroradiometer using cryogenic	ally		Vacuum probe sampler removes micron	-sized	
	cooled detector			particles from surfaces		
	MSC-11688	B68-10245	02	SAN-10003	B68-10231	04
	Fluorescent particles enable visual	ization		Dual rate pressure relief valve		3.
	of gas flow M-FS-14583	B68-10259	02	MSC-11606	B68-10237	05
		D00 10203	02	ORTHOTROPIC SHELLS		
	FORTRAN optical lens design program			Computer program analyzes Buckling	Of	
	NPO-10603	B68-10354	06	Shells Of Revolution with various construction, BOSOR	wall	
	UV detector monitors organic contam	ination		LANGLEY-10290	B68-10226	06
	of optical surfaces					
	M-FS-20246	B68-10413	01	OSCILLATING CYLINDERS  Large-amplitude inviscid fluid moti	on in an	
OF	TIMAL CONTROL			accelerating container	un	
	Design techniques - Stochastic cont		0.2	MSC-11560	B68-10170	02
	MSC-11554	B68-10234	02	OSCILLATION DAMPERS		
OF	TIMIZATION			Suspended chains damp wind-induced		
	Automatic planning concept - An ana	lysis of		oscillations of tall flexible str		
	optimum scheduling M-FS-14198	B68-10127	06	LANGLEY-10193	B68-10042	05
				Device damps fluid pressure oscilla	tions in	
	Assembly, checkout, and operation			vent valve	D.C. 1	
	optimization analysis technique f complex systems	o <b>r</b>		M-FS-13290	B68-10078	05
	M-FS-14105	B68-10222	05			

OSCILLATIONS  Amplitude and frequency readout overl  GSFC-10183	lay 368–10054	01	Manganese-alumina-ceramic glass eliminates rigid controls necessary in bonding metal to ceramics	
Power consumption in acoustic amplifi under conditions of maximum stable GSFC-10067		<b>01</b> ,	SAN-10012 B68-102  Preparation of silver-activated zinc sulfidential thin films	
OSCILLATORS		,	GSFC-10687 B68-102	271 03
Deep space FM system, a concept	868-10289	01	Ignition of binary alloys of uranium ARG-10057 B68-102	280 01
Dynamic linearity measurement technic KSC-10186	que 868-10290	01	Precise doping of metals by small gas flows LEWIS-10444 B68-105	
	be 868-10291	01	OXIDATION RESISTANCE Reinforced thermal-shock resistant ceramics LEWIS-10376 B68-100	
Improved gas ring laser MSC-11584	B68-10304	02	High strength nickel-base alloy with improved oxidation resistance up to 2200	
Communication system features dual mo range acquisition plus time delay	ode		degrees F LEWIS-10115 B68-100	094 03
measurement M~FS-14323	B68-10306	01	High-temperature bearing lubricants LEWIS-10408 B68-102	249 05
Laser Doppler gas-velocity instrument	t 868-10349	02	High temperature alloy	
A 35 GHz solid state transmitter/driv			LEWIS-10377 B68-102	253 03
	B68-10545	01	Nickel base alloy with improved stress rupture properties	
OSCILLOGRAPHS  Nondestructive test determines overlo destruction characteristics of curr			LEWIS-10283 B68-103  Tungsten fiber-reinforced nickel superallo	y
limiter fuses XGS-08566	B68-10364	01	LÉWIS-10424 B68-103	369 03
OSCILLOSCOPES System measures arc energy dissipated	d in		Nickel-base superalloy*s excellent properties promote its service to 2200 degrees F	
relay contact cycling	B68-10312	01	LEWIS-10355 B68-103	380 03
Nondestructive test determines overladestruction characteristics of cur- limiter fuses	oad		OXIDIZERS Ignition of binary alloys of uranium ARG-10057 B68-107	280 01
XGS-08566	B68-10364	01	Between-bearing shaft seal, a concept M-FS-18179 B68-102	286 05
System measures response time of photomultiplier tubes LEWIS-10437	B68-10382	01	OXYGEN  Evaluation of ignition mechanisms in	
Method for measuring alternator volt		01	selected nonmetallic materials MSC-11645 B68-10	167 03
transients	B68-10513	01	Saran film is fire-retardant in oxygen	
OUTPUT			atmosphere MSC-11604 B68-10	177 03
Tool reconstructs data input points corresponding to first order outpu M-FS-18003	t graph B68-10154	02	Zinc-oxygen primary cell yields high energy density	
Parallel-to-serial biphase-data conv			M-FS-14661 B68~10	218 01
	B68-10241	01	Improved fuel-cell-type hydrogen sensor M-FS-14656 B68-10	263 01
DVERVOLTAGE  Low energy chmmeter can be used to t  sensitive circuits, other meters	est		Rating of electrical wires in vacuum environments	
	B68-10269	01	MSC-15108 B68-10	362 01
Current-limiting voltage regulator MSC-11824	B68-10305	01	One-dimensional reacting gas nonequilibriu performance program MSC-11777 B68-10	
Transistorized Marx bank pulse circu provides voltage multiplication wi			One-dimensional two-phase reacting gas	
nanosecond rise-time	B68-10328	01	nonequilibrium performance program MSC-11780 B68-10	376 06
Nondestructive test determines overl			Axisymmetric reacting gas nonequilibrium performance program	
destruction characteristics of cur limiter fuses XGS-08566	B68-10364	01	MSC-11781 B68-10	377 06
OXIDATION	230 20004		Precise doping of metals by small gas flow LEWIS-10444 B68-10	rs 1526 03
Silicon oxide films grown in microwa discharge	ve		OZONE	•
M-FS-14634	B68-10171	01	Reaction rates of graphite with ozone measured by etch decoration	
Studies in zirconium oxidation ARG-10099	B68-10199	03	ARG-10086 B68-10	0101 03

3

				Controllability of distributed-para systems	meter	
DACKACEC	P			M-FS-14929	B68-10346	02
	age design provides for d constraint	cell		One-dimensional coulomb-damped wave in prismatic bars	motion	
MSC-11839		B68-10398	05	M-F3-14815	B68-10548	02
	ounting would increase it packaging density	B68-10114	01	PARTICLE ACCELERATION High-speed camera synchronization M-FS-18062	B68-10282	02
	iteria for transportation	on and		PARTICLE ACCELERATORS  Reducing bubbles in glass coatings electrical breakdown strength	improves	
M-FS-13007		B68-10219	05	LEWIS-10278	B68-10214	03
sensitive o	hmmeter can be used to circuits, other meters	test		Glass coated single grid for charge particle acceleration	d	
SAN-10013		B68-10269	01	LEWIS-10106	B68-10215	03
	r compatibility of prind d component lead materi		01	Advances in light-gas gun technolog M-FS-14270	y B68-10288	05
Food products MSC-11697	s for space applications	s B68-10324	04	PARTICLE EMISSION Graphite cloth facilitates vacuum evaporation of silicon monoxide M-FS-14764	B68-10256	03
	nal reacting gas nonequ	ilibrium			B00 10200	0.5
performance MSC-11777	e program	B68-10375	06	PARTICLE MOTION  An investigation of particle mixing gas-fluidized bed	in a	
Contamination M-FS-20185	n control handbook	B68-10392	03	ARG-10182	B68-10407	05
PAINTS Improved rela	ay optical element for lometer using cryogenic			PARTICLE SIZE DISTRIBUTION Characteristics of fluidized-packed ARG-10049	beds B68-10278	03
cooled dete MSC-11688	ector	B68-10245	02	Preparing rock powder specimens of controlled size distribution NPO-10007	B68-10297	05
wide-gap sp	pulse generator develo park chambers			PARTICLE TRAJECTORIES	•	
ARG-10136 Miniature pai	int-spray gun for reces:	B68-10283	01	An investigation of particle mixing gas-fluidized bed ARG-10182	B68-10407	05
areas MSC-13060		B68-10387	05	PARTICLES Microprobe investigation of brittle		
	on bonding of titanium	alloy		segregates in aluminum MIG and TI M-FS-14720		03
panels M-FS-14743		B68-10161	05	PASTES		
	ilstone fabrication and atherability of structu			Improved fuel-cell-type hydrogen se M-FS-14656	nsor B68-10263	01
NPO-10783 PARA HYDROGEN	atheraoffity of Structu	B68-10552	03	PATHOLOGY Color-televised medical microscopy MSC-13086	B68-10314	01
Real fluid pr	roperties of normal and				DOG 10014	01
parahydroge LEWIS-1045		B68-10361	06	PATIENTS Automated patient monitoring system M-FS-14552	B68-10131	01
PARACHUTES Quick-attach XFR-05421	clamp	B68-10250	05	New electrical plethysmograph monit	ors	36
		200 10000		MSC-11447	B68-10220	01
PARAFFINS High-tempera LEWIS-10408	ture bearing lubricants 8	B68-10249	05	Electrocardiograph transmitted by R telephone links in emergency situ FRC-10031		01
heater elem	cal cell has internal re	esistive		Automatic patient respiration failu detection system with wireless tr	re .	
GSFC-10358 PARAMETERIZATION	<b>N</b>	B68-10325	01	ARC-10174 PATTERN RECOGNITION	B68-10365	01
Controllabili systems M-FS-14929	ity of distributed-para	meter B68-10346	02	Improvement in recording and readin holograms ERC-10151	g B68-10347	02
PARTIAL DIFFEREN	NTIAL EQUATIONS	200 10040	02	PEELING		V.E.
HICOV /Newtor	n-Raphson calculus of with automatic transver	salities/ B68-10232	06	Rotary-knife stripper facilitates roof X-ray film from pack M-FS-14837	emoval B68-10509	05
	differential equations in of transformation gro		02	PENS Machining technique prevents underc	utting	

LANGLEY-10281	B68-10352	05	M-FS-13898	B68-10258	01
PEPTIDES			Communication system features dual r	node	
Rate constants measured for hydrate	ed		range acquisition plus time delay		
electron reactions with peptides			measurement		
proteins			M-FS-14323	B68-10306	01
ARG-10195	B68-10424	04	Courter community antique phago change		
PERFORMANCE PREDICTION		,	System converts optical phase change RF phase changes	25 10	
Effect of surface irregularities of	n bellows		M-FS-20091	B68-10430	01
fatigue life					
M-FS-14480	B68-10229	05	PHASE RULE		
N	-11-11		The thermodynamic properties of the phase are studied	Wustite	
New method for critical failure pr of complex systems	saiction		ARG-10200	B68-10408	03
M-FS-14133	868-10252	02	1110 2000		
			PHASE SHIFT	•	
Nondestructive test determines ove			Method of reducing time base error	in	
destruction characteristics of c	urrent		dígital magnetic recorders GSFC-10108	B68-10317	01
XGS-08566	B68-10364	01	991 6-10109	200 2001.	• •
			Amplifier improvement circuit		
Axisymmetric two-phase perfect gas			LEWIS-10712	B68-10456	01
performance program	Dec 10774	0.6	PHOSPHIDES		
MSC-11774	B68-10374	06	Study of mechanical properties of u	ranium	
One-dimensional two-phase reacting	gas		compounds		
nonequilibrium performance progr	am		ARG-10074	B68-10197	03
MSC-11780	B68-10376	06	NUCCOUGDYS ASID		
PERFORMANCE TESTS			PHOSPHORIC ACID  Method for removing surface-damaged	lavers	
Assembly, checkout, and operation			from nickel alloys	1430.0	
optimization analysis technique	for		M-FS-18151	B68-10522	03
complex systems					
M-FS-14105	B68-10222	05	PHOSPHORS  Preparation of silver-activated zinc	c sulfide	
PERSONNEL			thin films	c surrice	
Computer program conducts faciliti	es		GSFC-10687	B68-10271	03
utilization and occupancy survey					
NPQ-10438	B68-10137	06	PHOSPHORUS  Luminescent screen composition for		
PERSONNEL SELECTION			cathode ray tubes		
Contamination control handbook			ERC-19	B68-10056	01
M-FS-20185	B68-10392	03			
DODGUDDARTON MUDODY			PHOTOCATHODES Improved electro-optical tracking s	vetom	
PERTURBATION THEORY  Dynamics of moving bubbles in sing	le and		M-FS-14791	B68-10311	01
binary component systems					
M-FS-14845	B68-10339	02	PHOTOCONDUCTIVITY		
DE TROOP A DUV			Improved radiographic image amplifi M-FS-14522	er panel B68-10363	02
PETROGRAPHY Preparing rock powder specimens of			M-F 5-14022	800 10000	42
controlled size distribution			Integrated metal transistor leads		
NPD-10007	B68-10297	05	GSFC-90536	B68-10518	01
P.U.			PHOTODIODES		
PH Hydrogen peroxide etching proves u	seful for		Selective video blanking technique		
germanium	30141 101		M-FS-20013	B68-10434	01
ARG-10170	B68-10454	03			
DUAGE DEVITATION			PHOTOELECTRIC CELLS		
PHASE DEVIATION Improved gas ring laser			High-speed camera synchronization M-FS-18062	B68-10282	02
MSC-11584	B68-10304	02			
			Telescope dome control system autom	atically	
PHASE ERROR			tracks sun MSC-10966	B68-10521	02
Method of reducing time base error digital magnetic recorders	1 N		W2C-10300	000-10021	U.
GSFC-10108	B68-10317	01	PHOTOELECTRIC EMISSION		
			CIRCUSA digital computer program		
			transient analysis of electronic		
PHASE LOCK DEMODULATORS					06
Improved phase locked loop receive		01	M-FS-15002	B68-10416	06
	B68-10008	01			06
Improved phase locked loop receive GSFC-09561  PHASE LOCKED SYSTEMS	B68-10008	01	M-FS-15002  PHOTOGRAPHIC EQUIPMENT  Improvement in recording and readin	B68-10416	06
Improved phase locked loop receive GSFC-09561 PHASE LOCKED SYSTEMS Diversity RF receiving system with	B68-10008	01	M-FS-15002  PHOTOGRAPHIC EQUIPMENT  Improvement in recording and readin holograms	B68-10416	
Improved phase locked loop receive GSFC-09561  PHASE LOCKED SYSTEMS Diversity RF receiving system with improved phase-lock characterist	B68-10008		M-FS-15002  PHOTOGRAPHIC EQUIPMENT  Improvement in recording and readin	B68-10416	08
Improved phase locked loop receive GSFC-09561 PHASE LOCKED SYSTEMS Diversity RF receiving system with	B68-10008	01	M-FS-15002  PHOTOGRAPHIC EQUIPMENT  Improvement in recording and readin holograms  ERC-10151	B68-10416 g B68-10347	
Improved phase locked loop receive GSFC-09561  PHASE LOCKED SYSTEMS  Diversity RF receiving system with improved phase-lock characterist XGS-01222  Phase-lock loop frequency control	B68-10008 ics B68-10068		M-FS-15002  PHOTOGRAPHIC EQUIPMENT Improvement in recording and readin holograms ERC-10151  Rotary-knife stripper facilitates r	B68-10416  g B68-10347 removal	02
Improved phase locked loop receive GSFC-09561  PHASE LOCKED SYSTEMS Diversity RF receiving system with improved phase-lock characterist XGS-01222  Phase-lock loop frequency control dropout problem	B68-10008 ics B68-10068 and the	01	M-FS-15002  PHOTOGRAPHIC EQUIPMENT Improvement in recording and readin holograms ERC-10151  Rotary-knife stripper facilitates r	B68-10416 g B68-10347	
Improved phase locked loop receive GSFC-09561  PHASE LOCKED SYSTEMS  Diversity RF receiving system with improved phase-lock characterist XGS-01222  Phase-lock loop frequency control	B68-10008 ics B68-10068		M-FS-15002  PHOTOGRAPHIC EQUIPMENT Improvement in recording and readin holograms ERC-10151  Rotary-knife stripper facilitates r of X-ray film from pack M-FS-14837	B68-10416  g B68-10347 removal	02
Improved phase locked loop receive GSFC-09561  PHASE LOCKED SYSTEMS Diversity RF receiving system with improved phase-lock characterist XGS-01222  Phase-lock loop frequency control dropout problem	B68-10008 ics B68-10068 and the	01	M-FS-15002  PHOTOGRAPHIC EQUIPMENT Improvement in recording and readin holograms ERC-10151  Rotary-knife stripper facilitates r	B68-10416  g B68-10347 removal	02
Improved phase locked loop receive GSFC-09561  PHASE LOCKED SYSTEMS Diversity RF receiving system with improved phase-lock characterist XGS-01222  Phase-lock loop frequency control dropout problem M-FS-13948  PHASE MODULATION Electro-optic modulator for infra	B68-10008 ics B68-10068 and the B68-10130	01	M-FS-15002  PHOTOGRAPHIC EQUIPMENT Improvement in recording and readin holograms ERC-10151  Rotary-knife stripper facilitates r of X-ray film from pack M-FS-14837  PHOTOGRAPHIC FILM	B68-10416  g B68-10347 removal	02
Improved phase locked loop receive GSFC-09561  PHASE LOCKED SYSTEMS  Diversity RF receiving system with improved phase-lock characterist XGS-01222  Phase-lock loop frequency control dropout problem M-FS-13948  PHASE MODULATION  Electro-optic modulator for infrancising gallium arsenide crystal	ics B68~10068 and the B68~10130	01	M-FS-15002  PHOTOGRAPHIC EQUIPMENT Improvement in recording and readin holograms ERC-10151  Rotary-knife stripper facilitates r of X-ray film from pack M-FS-14837  PHOTOGRAPHIC FILM Hydra 1 data display system MSC-11594	B68-10416  B68-10347  Pemoval  B68-10509	02 05
Improved phase locked loop receive GSFC-09561  PHASE LOCKED SYSTEMS Diversity RF receiving system with improved phase-lock characterist XGS-01222  Phase-lock loop frequency control dropout problem M-FS-13948  PHASE MODULATION Electro-optic modulator for infra	B68-10008 ics B68-10068 and the B68-10130	01	M-FS-15002  PHOTOGRAPHIC EQUIPMENT Improvement in recording and readin holograms ERC-10151  Rotary-knife stripper facilitates r of X-ray film from pack M-FS-14837  PHOTOGRAPHIC FILM Hydra 1 data display system MSC-11594  X-ray film holder permits single	B68-10416  B68-10347  Temoval  B68-10509	02 05
Improved phase locked loop receive GSFC-09561  PHASE LOCKED SYSTEMS  Diversity RF receiving system with improved phase-lock characterist XGS-01222  Phase-lock loop frequency control dropout problem M-FS-13948  PHASE MODULATION  Electro-optic modulator for infrancising gallium arsenide crystal	B68-10008  ics B68-10068  and the B68-10130  ed laser B68-10255	01	M-FS-15002  PHOTOGRAPHIC EQUIPMENT Improvement in recording and readin holograms ERC-10151  Rotary-knife stripper facilitates r of X-ray film from pack M-FS-14837  PHOTOGRAPHIC FILM Hydra 1 data display system MSC-11594	B68-10416  B68-10347  Temoval  B68-10509	02 05

Rotary-knife stripper facilitates: of X-ray film from pack	removal		PHYSIOLOGICAL EFFECTS Study of radiation effects on mammalian cells	
M-FS-14837	B68-10509	05	in vitro ARG-10191 B68-10294	02
PHOTOGRAPHIC RECORDING High-speed camera synchronization M-FS-18062	B68-10282	02	PHYSIOLOGICAL RESPONSES Infrared viewing permits human iris	
PHOTOGRAPHY Photographic and drafting techniqu	es		response studies ERC-10003 B68-10206	04
simplify method of producing eng drawings	ineering		PHYSIOLOGY	
MSC-716	B68-10128	02	Automated patient monitoring system M-FS-14552 B68-10131	01
Fluorescent particles enable visua of gas flow	lization		PIEZOELECTRIC CRYSTALS Fluidic-thermochromic display device	
M-FŠ-14583	B68-10259	02	ERC-10031 B68-10350	01
X-ray film holder permits single			PIEZOELECTRIC TRANSDUCERS	
continuous picture of tubing joi LEWIS-10382	nt B68-10343	05	Automatic system nondestructively monitors and records fatigue crack growth	
An investigation of particle mixing	gina		LANGLEY-10091 B68-10379	01
gas-fluidized bed ARG-10182	B68-10407	05	PIEZOELECTRICITY	
ANG 10102	B00-10407	03	Improved gas ring laser MSC-11584 B68-10304	92
Rapid-response, light-exposure con system	trol		Dougn computation in according and lifting	
NPO-10238	B68-10502	01	Power consumption in acoustic amplifiers under conditions of maximum stable gain GSFC-10067 B68-10327	01
PHOTOLUMINESCENCE Electronic gating circuit and ultr	auialat		PIEZORESISTIVE TRANSDUCERS	
laser excitation permit improved			Pressure-sensitive bonded junction	
sensitivity ARG-10109	B68-10077	02	transducers ERC-10087 B68-10563	01
	200 10011	<b>V</b> D		01
PHOTOMETERS Stereo photomacrography system			PIGGYBACK SYSTEMS Concept to standardize space vehicle	
LANGLEY-10176	B68-10141	01	piggyback experiment modules	
UV detector monitors organic conta	mination		M-FS-1697 B68-10038	05
of optical surfaces M-FS-20246	B68-10413	01	PIPELINES Conceptual apparatus for detecting leaks of	
PHOTOMICROGRAPHY			nonconductive liquids M-FS-14713 B68-10303	01
Stereo photomacrography system			N-F3-14713 B00-10303	01
LANGLEY-10176	B68-10141	01	Weld preparation tool for pipes and tubing KSC-09955 B68-10551	05
One hundred angstrom niobium wire LEWIS-10128	B68-10279	03	PIPES (TUBES)	
PHOTOMULTIPLIER TUBES			Flow tube used to cool solar-pumped laser	
New camera tube improves ultrasoni	c		MSC-11026 B68-10010	02
inspection system ARG-90237	B68-10088	01	Heat-shrink plastic tubing seals joints in	
	,		glass tubing	
Improved electro-optical tracking : M-FS-14791	system B68-10311	01	LEWIS-10329 B68-10040	05
Incom Donnlan was valently to them			Remotely installed pipe plug provides	
Laser Doppler gas-velocity instrum M-FS-20039	B68-10349	02	effective seal in hazardous environment NUC-10303 B68-10053	05
System measures response time of			Method for reinforcing tubing joints	
photomultiplier tubes LEWIS-10437	B68-10382	0.1	MSC-11108 B68-10115	05
	DOU-10302	01	System remotely inspects, measures, and	3
PHOTOSENSITIVITY Gimbal angle sensor			records internal irregularities in piping M-FS-14545 B68-10149	01
GSFC-10305	B68-10315	01	N-13-14040 DOU-10143	01
System measures response time of			Tube swaging device uses explosive force LANGLEY-10092 B68-10235	05
photomultiplier tubes				00
LEWIS-10437	B68-10382	01	Tensile testing grips ensure uniform loading of bimetal tubing specimens	
PHOTOTRANSISTORS			LEWIS-10267 B68-10248	05
Selective video blanking technique M-FS-20013	B68-10434	01	One hundred angstrom niobium wire	
PHOTOVOLTAIC CELLS			LEWIS-10128 B68-10279	03
Feasibility study of wireless power	r		Fabrication techniques developed for small-	
transmission systems M-FS-14691	B68-10309	01	diameter, thin-wall tungsten and tungsten alloy tubing	
	200 10003	V.	ARG-10100 B68-10284	05
PHYSICAL PROPERTIES Hastelloy X properties, data, and			Electron beam selectively seals porous metal	
metallurgical characteristics NUC-10302	B68-10023	03	filters LEWIS-10162 B68-10331	05
	200 10020	00		50
			X-ray film holder permits single	

continuous picture of tubing joint LEWIS-10382	B68-10343	05	PLOTTERS FORTRAN optical lens design program NPO-10603	B68-10354	06
Hand-tightened, high-pressure seal M-FS-18416	B68-10417	05	PLUGS		
Tube joint leak repair coupling MSC-15022	B68-10540	05	Remotely installed pipe plug provide effective seal in hazardous envíro NUC-10303	nment	05
Weld preparation tool for pipes and KSC-09955	tubing B68-10551	05	X-ray film holder permits single continuous picture of tubing joint		05
PISTONS  Conceptual dead weight device to pro	ovide		LEWIS-10382 PLUNGERS	D0010343	05
pressure calibration M-FS-14672	B68-10264	01	High-speed pulse camera	B68-10329	02
PITOT TUBES  A mass flux probe for measurement in supersonic stream	ı a		PNEUMATIC EQUIPMENT Pneumatic raft automatically reforms rupture of buoyant member	after	
	B68-10533	02		B68-10011	05
PIVOTS Swing arm carrier protects flexible during test item rotation	lines		High- and low-pressure pneumotachome measure respiration rates accurate adverse environments		
	B68-10037	05		B68-10188	01
PLANFORMS Modified Multhopp mean camber comput program	;er		Portable, high intensity isotopic ne source provides increased experime accuracy		
LANGLEY-10376	B68-10446	06		B68-10243	02
PLANOTRONS Feasibility study of wireless power transmission systems			Indium adhesion provides quantitativ measure of surface cleanliness SAN-10024	e B68-10342	01
M-FS-14691 PLASTICS	B68-10309	01	Fluidic-thermochromic display device ERC-10031	B68-10350	01
Heat-shrink plastic tubing seals joi glass tubing LEWIS-10329	ints in B68-10040	05	POINT DEFECTS  Resistivity measurements of  neutron-irradiated pure metals and	A1-2n	
Plastic preforms facilitate fabricat of welded cordwood electronic modu			alloys	B68-10200	03
LEWIS-90339	B68-10063	01	POINTS (MATHEMATICS)		
Improved molding process ensures pla parts of higher tensile strength	astic		The X square statistic and goodness test	of fit	
LANGLEY-10033	B68-10132	05	GSFC-10547	B68-10136	02
X-ray film holder permits single continuous picture of tubing joint LEWIS-10382	t B68-10343	05	POISONING Product identification techniques us training aids for analytical chemi SAN-10025		03
Evaluation of a fluorocarbon plastic in cryogenic valve seals	used		POLARIZATION		
M-FS-18189 PLASTISOLS	B68-10523	03	Isotopically pure magnesium isotope- prepared from magnesium-24 oxide ARG-10154	24 is B68-10293	02
Compressible sleeve provides automat centering for grinding or turning			POLARIZATION (WAVES)		UL
cylinders SAN-10021	B68-10318	05	Electro-optic modulator for infrared using gallium arsenide crystal GSFC-10686	1aser B68-10255	02
PLATES (STRUCTURAL MEMBERS) Weld joint strength and mechanical p	properties		POLARIZED LIGHT		02
in 2219-T81 aluminum alloy LEWIS-10479	B68-10561	03	Synthesis of electro-optic modulator amplitude modulation of light M-FS-14268	B68-10275	02
PLATING  Ion plating technique improves thin	film		POLARI ZERS	DOG 10270	02
deposition SAN-10006	B68-10212	03	Rapid-response, light-exposure contr system		0.1
PLATINUM  Method of maintaining activity of hydrogen-sensing platinum electron	ie		NPO-10238  POLLUTION  New method for critical failure pred	B68-10502	01
M-FS-1422	B68-10049	03	of complex systems M-FS-14133	B68-10252	02
Viscosity and density of methanol/wa mixtures at low temperatures M-FS-14991	B68-10274	03	POLYCRYSTALS Grain-boundary migration in KCl bics ARG-10181	ystals B68-10455	03
Optimetric system facilitates color: and fluorometric measurements NPO-10233	imetric B68-10316	01	POLYESTER RESINS Thermal protective visor for entering		55
Improved radiographic image amplific M-FS-14522	er panel B68-10363	02	high temperature areas MSC-10285	B68-10277	05

POLYESTERS High-temperature bearing lubricants LEWIS-10408	B68-10249	05	Study of optimum discrete estimators measurement analysis M-FS-14915		02
POLYMERIC FILMS  Thermal protective visor for entering high temperature areas	ng		POSITIONING Closed circuit TV system automaticall guides welding arc	ly	
MSČ-10285	B68-10277	05		368-10357	01
POLYMERS Improved fuel-cell-type hydrogen ser M-FS-14656	nsor B68-10263	01	POSITIONING DEVICES (MACHINERY) X-ray film holder permits single continuous picture of tubing joint LEWIS-10382	868-10343	05
Temperature or pressure controller LEWIS-10297	B68-10337	01	Remotely operated gripper provides ve	ertical	
POLYNOMIALS Simultaneous message framing and err	ror		ARG-10160 E	868-10359	05
detection MSC-12001	B68-10330	01	High-torque precision stepping drive M-FS-14772 I	B68-10549	05
POLYPHENYL ETHER High-temperature bearing lubricants LEWIS-10408	B68-10249	05	POTASSIUM CHLORIDES Grain-boundary migration in KCl bicry ARG-10181		03
POLYSTYRENE Fast-response cup anemometer feature	es		POTASSIUM CHROMATES  A rapid stress-corrosion test for all allows	uminum	
cosine response ARG-90193	B68-10202	01		B68-10536	03
POLYTETRAFLUOROETHYLENE Bearings use dry self-lubricating camaterials LEWIS-10432	age B68-10165	05	POTENTIAL FLOW Acoustic wave analysis M-FS-18076	868-10265	20
POLYURETHANE FOAM Locating and sealing air leaks in	866-10165	05	POTENTIOMETERS (INSTRUMENTS) Fixture facilitates soldering operati M-FS-14456		05
multiroomed buildings NUC-10304 Fire retardant foams developed to su	B68-10024	05	Digital computer technique for setup checkout of an analog computer M-FS-13969		06
fuel fires ARC-10098	B68-10358	03	POTENTIOMETERS (RESISTORS) Capacitance-coupled wiper increases		
Fiberglass prevents cracking of polyurethane foam insulation on crackers.	-		potentiometer life ARC-10060	868-10175	01
M-FS-20058 POLYURETHANE RESINS	B68-10406	02	POTTING COMPOUNDS  Method of disjoining adhesively bonds electronic cordwood modules		
Compressible sleeve provides automatic centering for grinding or turning					01
cylinders SAN-10021	B68-10318	05	Thermal resistances of solder-boss/po compound combinations MSC-12074	•	01
POROSITY Welding of commercial base plates is	s		Astronaut space suit communication as		
investigated M-FS-13649	B68-10192	03		B68-10238	01
Grain growth inhibitor for porous to materials LEWIS-10535	ungsten B68-10527	03	POWDER (PARTICLES) Preparing rock powder specimens of controlled size distribution NPD-10007	B68-10297	05
Method for controlling density and			Thermal conductivity and dielectric		
permeability of sintered powdered LEWIS-10393	metals B68-10528	03	of silicate materials		68
POROUS MATERIALS  Electron beam selectively seals poro	ous metal		POWDER METALLURGY Grain growth inhibitor for porous tur	ngsten	
filters LEWIS-10162	B68-10331	05	materials LEWIS-10535 I	B68-10527	03
Hydrostatic testing of porous assemble M-FS-18298	blies B68-10439	05	Method for controlling density and permeability of sintered powdered i LEWIS-10393		03
Method for controlling density and permeability of sintered powdered LEWIS-10393	metals B68-10528	03	POWER GAIN  Power consumption in acoustic amplify under conditions of maximum stable	gain	
POSITION (LOCATION)  Locating and sealing air leaks in multiroomed buildings NUC-10304	B68-10024	05	GSFC-10067  POWER SUPPLIES  Recharge unit provides for optimum	B68-10327	01
Detection and location of metallic of imbedded in nonmetallic structure	objects		recharging of battery cells	B68-10273	01
M-FS-14790	B68-10183	01	High-torque power wrench, a concept M-FS-18194	B68-10299	05

			•		
Electrochemical cell has internal r heater element	esistive		PRESSURE EFFECTS  Improved atomic resonance gas cell for	or use	
GSFC-10358	B68-10325	01	in frequency standards	B68-10230	01
High-efficiency step-up regulator M-FS-20049	B68-10432	01	Compressible sleeve provides automat		
	200 10402	,	centering for grinding or turning		
POWER SUPPLY CIRCUITS  Circuit detects voltage decrease in computer power supply	ı		cylinders SAN-10021	B68-10318	05
KSC-67-120	B68-10019	01	Computer program analyzes and design	s	
Short circuit protection for a powe	r		supersonic wing-body combinations ARC-10141	B68-10335	06
distribution system M-FS-14993	B68-10443	01	PRESSURE MEASUREMENTS		
POWER TRANSMISSION Feasibility study of wireless power			Quasi-static vapor pressure measurem on reactive systems in inert atmos		01
transmission systems M-FS-14691	B68-10309	01	Welder analyzer		
PREAMPLIFIERS		•	MSC-12068	B68-10242	01
Improved relay optical element for spectroradiometer using cryogenic			Silicon strain sensors enable pressu measurement at cryogenic temperatu		
cooled detector	-			B68-10262	01
MSC-11688	B68-10245	02	Conceptual dead weight device to pro	vide	
Laser Doppler gas-velocity instrume M-FS-20039	ent B68-10349	02	pressure calibration M-FS-14672	B68-10264	01
		0.5		200 2020.	-
Low-cost, fast-response drive circu electromagnetic torque motors			Real fluid properties of normal and parahydrogen		
LEWIS-10143	B68-10386	01	LEWIS-10458	B68-10361	06
High resolution Ge /Li/ spectromete reduces rate-dependent distortion			Cooled miniature pressure transducer effective at high temperatures	s	
counting rates	•			B68-10370	01
ARG-10144	B68-10420	01	A mass flux probe for measurement in	a	
PRECIPITATION HARDENING Weld microfissuring in Inconel 718			supersonic stream LEWIS-10695	B68-10533	02
minimized by minor elements M-FS-18185	B68-10251	03	PRESSURE PULSES		
PRECISION			Magnetic forming studies M-FS-14217	B68-10186	02
Modified sine bar device measures s	small		PRESSURE RECOVERY		
angles with high accuracy GSFC-438	B68-10322	02	Venturi meter with separable diffuse	r B68-10295	05
PREDICTIONS Study of optimum discrete estimator	ra in		PRESSURE REDUCTION		
measurement analysis M-FS-14915	B68-10348	02	Dual rate pressure relief valve	B68-10237	05
	D00-10540	V.E		10207	00
PREFORMS Plastic preforms facilitate fabrica			Design of fluid-duct bends with low pressure loss		
of welded cordwood electronic mod LEWIS-90339	dules B68-10063	01	M-FS-20176	B68-10395	05
PREPARATION			PRESSURE REGULATORS  Dynamically stable check valve conce	nt for	
Weld preparation tool for pipes and			wide flow range	•	
KSC-09955	B68-10551	05	M-FS-14579	B68-10247	05
PRESERVING Food products for space application	ns		Temperature or pressure controller LEWIS-10297	B68-10337	01
MSC-11697	B68-10324	04	Fluidic transducer gives pressure ou	itnut as	
PRESSING (FORMING)			function of temperature	B68-10537	05
Improved molding process ensures popularity of higher tensile strength				P00[0231	03
LANGLEY-10033	B68-10132	05	PRESSURE SENSORS  Dual rate pressure relief valve		
PRESSURE DISTRIBUTION  Distillation device supplies cesium	m vanor at		MSC-11606	B68-10237	05
constant pressure XNP-08124	B68-10020	03	Miniature pressure transducer for st member application	ressed	
		03		B68-10246	01
Computer program analyzes and design supersonic wing-body combinations		8	Sílicon strain sensors enable pressu	ıre	
ARC-10141	B68-10335	06	measurement at cryogenic temperatu M-FS-14703	ıres B68-10262	01
Computer program TRACK performs tr and/or steady state thermal anal;			Cooled miniature pressure transducer		
coupled fluid flow and heat cond	uction	06	effective at high temperatures		01
NUC-10189	B68-10450	06		B68-10370	01
PRESSURE DROP Characteristics of fluidized-packet	d beds		Automatic calibration system for pre transducers	ssure	
ARG-10049	B68-10278	03		B68-10412	01

PRESSURE VESSELS SUBJECT INDEX

Combination probe for airflow measurements LEWIS-10281 B68-1055	8 01	supersonic stream LEWIS-10695 B68-10533	02
Pressure-sensitive bonded junction transducers		PROBLEM SOLVING Linear systems of equations solved using	
ERC-10087 B68-1056	3 01	mathematical algorithms ARG-10146 B68-10292	06
PRESSURE VESSELS  High-voltage pulse generator developed for wide-gap spark chambers  ARG-10136  B68-1028	33 01	Product identification techniques used as training aids for analytical chemists SAN-10025 B68-10373	03
Analysis of filament reinforced metal-shell		Charts designate probable future	•
pressure vessels LEWIS-10352 B68-1040	05 06	oceanographic research fields M-FS-20202 B68-10397	01
Temperature controlled strain gaged extensometer		PRODUCT DEVELOPMENT Projection transparencies from printed	
LEWIS-10353 B68-1054	3 01	material M-FS-14608 B68-10112	01
PRESSURIZING Compact monitoring and control console for		Improved molding process ensures plastic	
pressurized gas bottles M-FS-14874 B68-1040	05	parts of higher tensile strength LANGLEY-10033 B68-10132	05
PRINTED CIRCUITS Optical system facilitates inspection of		Study of convective magnetohydrodynamic channel flow	
printed circuit boards GSFC-07971 B68-1002	21 02	ARG-10102 B68-10181	. 02
Inspection criteria ensure quality control of parallel gap soldering		PRODUCTION ENGINEERING Automatic planning concept - An analysis of optimum scheduling	
M-FS-14530 B68-1025	7 05	M-FS-14198 B68-10127	06
Standards for compatibility of printed circuit and component lead materials M-FS-14531 B68-1031	0 01	An economical method for the continuous production of iodine-123 LEWIS-10518 B68-10433	03
Fixture facilitates soldering operations M-FS-14456 B68-1057		PROGRAMMERS Numerical Control Machine Data Manual	,
PRINTERS (DATA PROCESSING)		M-FS-14342 B68-10080	05
Digital data averager improves conventional measurement system performance MSC-12078 B68-1001	8 01	PROGRAMMING Development of Electronic Data Processing /EDP/ augmented management system	
Fully automatic telemetry data processor	.6 01	M-FS-14715 B68-10287	06
GSFC-10576 B68-1033 PRISMATIC BARS	36 01	Random access-random release relay switching matrix M-FS-12590 B68-10301	. 01
One-dimensional coulomb-damped wave motion in prismatic bars		PROJECT MANAGEMENT	
M-FS-14815 B68-1054 PRISMS	18 02	Development of Electronic Data Processing /EDP/ augmented management system M-FS-14715 B68-10287	' 06
Laser Doppler gas-velocity instrument M-FS-20039 B68-1034	9 02	PROPELLANT SPRAYS	00
PROBABILITY DENSITY FUNCTIONS Independent doubly truncated gamma variables		Two-fluid, impinging-sheet injector NPO-10547 B68-10338	05
M-FS-20143 B68-1034		PROPELLANT TANKS Study of cryogenic container thermodynamics	
PROBABILITY DISTRIBUTION FUNCTIONS  The X square statistic and goodness of fit test		during propellant transfer M-FS-14310 B68-10108	02
.GSFC-10547 B68-1013	36 02	PROPELLANT TRANSFER Fuel transfer system permits rapid	<b>₽</b>
Computer program determines exact two-sided tolerance limits for normal distributions M-FS-18045 B68-1019	58 06	coupling M-FS-91326 B68-10039	05
Independent doubly truncated gamma variables		Study of cryogenic container thermodynamics during propellant transfer	
M-FS-20143 B68-1034		M-FS-14310 B68-10108	02
PROBABILITY THEORY Study of optimum discrete estimators in measurement analysis M-FS-14915 B68-1034	18 02	PROPELLANTS Axisymmetric two-phase perfect gas performance program MSC-11774 B68-10374	. 06
PROBES			. 30
Vacuum probe sampler removes micron-sized particles from surfaces		Axisymmetric reacting gas nonequilibrium performance program MSC-11781 B68-10377	06
SAN-10003 B68-1023	31 04	PROPULSION SYSTEM PERFORMANCE	
Indium adhesion provides quantitative measure of surface cleanliness SAN-10024 B68-1034	42 01	Rocket engine analog simulation M-FS-14511 B68-10511	01
A mass flux probe for measurement in a		PROTECTION Mechanical shielding reduces weld surface	

cracking in 6061 T6 aluminum MSC-11494	B68-10022	05	limiter fuses XGS-08566 B	368-10364	01
Panelized high performance multila insulation M-FS-14023	nyer B68-10031	03	PULSE DURATION MODULATION Analysis and design of a class-D ampl M-FS-14803	lifier 368-10313	01
0.10 1400	DOC 10001		11 15 14000	000 10010	0.1
PROTECTIVE CLOTHING  Concept to comfort-condition subjewearing restrictive clothing  MSC-10964	ects B68-10178	03	PULSE GENERATORS One-shot pulse shaper circuit XGS-11379	368~10012	01
MSC-10964	869-101/8	02	High-voltage pulse generator develope	ed for	
Thermal protective visor for enter	ring		wide-gap spark chambers		
high temperature areas	700 10055		ARG-10136 B	368-10283	01
MSC-10285	B68-10277	05	Solid state high-voltage pulser opera	ates	
Biological isolation garment MSC-12206	B68-10500	04	with low supply voltage	368-10308	01
PROTECTIVE COATINGS			Transistorized Marx bank pulse circui	:+	
Encapsulation technique eliminates stresses in welded electronic mo M-FS-14581		01	provides voltage multiplication wit nanosecond rise-time		01
Miniature paint-spray gun for rece	esed		PULSE MODULATION		
areas			Acquisition of pseudonoise signals by	<del>J</del>	
MSC-13060	B68-10387	05	sequential estimation		
Structural thermal-control coating			M-FS-13898	368-10258	01
NPO-10785	B68-10553	03	PULSE POSITION MODULATION		
5 23.57	200 2000		Four pi-recoil proportional counter u	ised as	
PROTEINS			neutron spectrometer		
Study of behavior of sterols at ii ARG-10085	nterfaces B68-10281	03	ARG-10101 E	368-10326	02
MO 1000	200 10201	00	PULSE RATE		
Rate constants measured for hydra			Transistorized Marx bank pulse circui		
electron reactions with peptides proteins	s and		<pre>provides voltage multiplication wit nanosecond rise-time</pre>	th	
ARG-10195	B68-10424	04		868-10328	01
		- •			
PROTONS Four pi-recoil proportional counte	er used as		PULSE WIDTH AMPLITUDE CONVERTERS Linear analog dc voltage-to-pulse-wid	ith	
neutron spectrometer ARG—10101	B68-10326	02	converter GSFC-556 E	868-10003	01
	500 10050		2010 000	000 1000	•-
Rate constants measured for hydra			PULSED LASERS	_	
electron reactions with peptides			Laser system used for dynamic balanci	ing of	
		04	Laser system used for dynamic balanci gyros	ing of B68-10225	05
electron reactions with peptide: proteins ARG-10195	s and	04	Laser system used for dynamic balanci gyros M-FS-12218	B68-10225	05
electron reactions with peptides proteins ARG-10195 PROTOTYPES	s and	04	Laser system used for dynamic balanci gyros M-FS-12218 Repetitively pulsed, wavelength-selec	B68-10225	05
electron reactions with peptide: proteins ARG-10195	s and	04	Laser system used for dynamic balanci gyros M-FS-12218 Repetitively pulsed, wavelength-selec carbon dioxide laser	B68-10225	05
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electron reactions with peptide:     proteins     ARG-10195  PROTOTYPES     Precision bolometer bridge     MSC-11473  PSEUDONOISE	8 and B68-10424 B68-10156		Laser system used for dynamic balanci gyros M-FS-12218 E Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178 E	B68-10225 ctive B68-10564	
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation	B68-10424 B68-10156		Laser system used for dynamic balanci gyros M-FS-12218 E Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178 E PULSES Ultrasonic temperature measuring devi	B68-10225 ctive B68-10564	
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals	8 and B68-10424 B68-10156		Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devi LEWIS-10446	B68-10225 ctive B68-10564	02
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898	B68-10424  B68-10156  B by  B68-10258	01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devi LEWIS-10446  PUMICE	868-10225 ctive 868-10564 ice 868-10319	02
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation	B68-10424  B68-10156  B by  B68-10258  1 mode	01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devi LEWIS-10446  PUMICE Thermal conductivity and dielectric of	868-10225 ctive 868-10564 ice 868-10319	02
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dela measurement	B68-10424  B68-10156  B by  B68-10258  I mode	01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devi LEWIS-10446  PUMICE Thermal conductivity and dielectric of	868-10225 ctive 868-10564 ice 868-10319	02
electron reactions with peptide: proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signal: sequential estimation M-FS-13898  Communication system features dua range acquisition plus time deli-	B68-10424  B68-10156  B by  B68-10258  1 mode	01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-select carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devi LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856	868-10225 ctive 868-10564 ice 868-10319	02
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dels measurement M-FS-14323  PULLING	B68-10424  B68-10156  B by  B68-10258  I mode  B68-10306	01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devi LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data proces	868-10225 ctive 868-10564 ice 868-10319 constant 868-10351	02
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dels measurement M-FS-14323  PULLING Indium adhesion provides quantita	B68-10424  B68-10156  B by  B68-10258  I mode  B68-10306	01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devi LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data proces	868-10225 ctive 868-10564 ice 868-10319 constant	02
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dels measurement M-FS-14323  PULLING Indium adhesion provides quantita measure of surface cleanliness	B68-10424  B68-10156  B by  B68-10258  I mode  B68-10306	01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selectory carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devious LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data proces	868-10225 ctive 868-10564 ice 868-10319 constant 868-10351	02 01
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dels measurement M-FS-14323  PULLING Indium adhesion provides quantita measure of surface cleanliness SAN-10024	B68-10424  B68-10156  B by  B68-10258  I mode  B68-10306	01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devi LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data proces GSFC-10576  PUNCHES Versatile impact hand tool	B68-10225 ctive B68-10564 ice B68-10319 constant B68-10351	02 01 03
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dels measurement M-FS-14323  PULLING Indium adhesion provides quantita measure of surface cleanliness SAN-10024  PULSE AMPLITUDE	B68-10424  B68-10156  B by  B68-10258  I mode  B68-10306	01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devi LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data proces GSFC-10576  PUNCHES Versatile impact hand tool	868-10225 ctive 868-10564 ice 868-10319 constant 868-10351	02
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dels measurement M-FS-14323  PULLING Indium adhesion provides quantita measure of surface cleanliness SAN-10024	B68-10424  B68-10156  B by  B68-10258  I mode  B68-10306  tive  B68-10342	01 01 01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devi LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data proces GSFC-10576  PUNCHES Versatile impact hand tool	B68-10225 ctive B68-10564 ice B68-10319 constant B68-10351	02 01 03
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dels measurement M-FS-14323  PULLING Indium adhesion provides quantita measure of surface cleanliness SAN-10024  PULSE AMPLITUDE One-shot pulse shaper circuit XGS-11379	B68-10424  B68-10424  B68-10156  B68-10258  I mode  B68-10306  tive  B68-10342	01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devi LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data proces GSFC-10576  PUNCHES Versatile impact hand tool M-FS-20140  PURGING Between-bearing shaft seal, a concept	B68-10225 ctive B68-10564 ice B68-10319 constant B68-10351 ssor B68-10336	02 01 03 01
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dels measurement M-FS-14323  PULLING Indium adhesion provides quantita measure of surface cleanliness SAN-10024  PULSE AMPLITUDE One-shot pulse shaper circuit XGS-11379  Nondestructive test determines ove	B68-10424  B68-10156  B by  B68-10258  I mode  B68-10306  tive  B68-10342  B68-10012  erload	01 01 01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devi LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data proces GSFC-10576  PUNCHES Versatile impact hand tool M-FS-20140  PURGING Between-bearing shaft seal, a concept	B68-10225 ctive B68-10564 ice B68-10319 constant B68-10351 ssor B68-10336	02 01 03
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dels measurement M-FS-14323  PULLING Indium adhesion provides quantitat measure of surface cleanliness SAN-10024  PULSE AMPLITUDE One-shot pulse shaper circuit XGS-11379  Nondestructive test determines ove destruction characteristics of	B68-10424  B68-10156  B by  B68-10258  I mode  B68-10306  tive  B68-10342  B68-10012  erload	01 01 01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selectory dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devious LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data proces GSFC-10576  PUNCHES Versatile impact hand tool M-FS-20140  PURGING Between-bearing shaft seal, a concept M-FS-18179	B68-10225 ctive B68-10564 ice B68-10319 constant B68-10351 ssor B68-10336	02 01 03 01
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dels measurement M-FS-14323  PULLING Indium adhesion provides quantita measure of surface cleanliness SAN-10024  PULSE AMPLITUDE One-shot pulse shaper circuit XGS-11379  Nondestructive test determines ove	B68-10424  B68-10156  B by  B68-10258  I mode  B68-10306  tive  B68-10342  B68-10012  erload	01 01 01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selectory of the carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devious LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data process GSFC-10576  PUNCHES Versatile impact hand tool M-FS-20140  PURGING Between-bearing shaft seal, a concept M-FS-18179  PUSH-PULL AMPLIFIERS Low-cost, fast-response drive circuit	B68-10225 ctive B68-10564 ice B68-10319 constant B68-10351 ssor B68-10336 B68-10371 t	02 01 03 01
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time delimeasurement M-FS-14323  PULLING Indium adhesion provides quantitameasure of surface cleanliness SAN-10024  PULSE AMPLITUDE One-shot pulse shaper circuit XGS-11379  Nondestructive test determines ove destruction characteristics of climiter fuses XGS-08566	B68-10424  B68-10424  B68-10156  B68-10258  I mode ay  B68-10306  tive  B68-10342  B68-10012  erload current	01 01 01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selectory dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devious LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data process GSFC-10576  PUNCHES Versatile impact hand tool M-FS-20140  PURGING Between-bearing shaft seal, a concept M-FS-18179  PUSH-PULL AMPLIFIERS Low-cost, fast-response drive circuit electromagnetic torque motors	B68-10225 ctive B68-10564 ice B68-10319 constant B68-10351 ssor B68-10336 B68-10371 t B68-10286 t for	02 01 03 01 05
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dels measurement M-FS-14323  PULLING Indium adhesion provides quantita measure of surface cleanliness SAN-10024  PULSE AMPLITUDE One-shot pulse shaper circuit XGS-11379  Nondestructive test determines ove destruction characteristics of limiter fuses XGS-08566  PULSE CODE MODULATION	B68-10424  B68-10424  B68-10156  B68-10258  I mode ay  B68-10306  tive  B68-10342  B68-10012  erload current  B68-10364	01 01 01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selectory dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devious LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data process GSFC-10576  PUNCHES Versatile impact hand tool M-FS-20140  PURGING Between-bearing shaft seal, a concept M-FS-18179  PUSH-PULL AMPLIFIERS Low-cost, fast-response drive circuit electromagnetic torque motors	B68-10225 ctive B68-10564 ice B68-10319 constant B68-10351 ssor B68-10336 B68-10371 t	02 01 03 01
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time delimeasurement M-FS-14323  PULLING Indium adhesion provides quantitameasure of surface cleanliness SAN-10024  PULSE AMPLITUDE One-shot pulse shaper circuit XGS-11379  Nondestructive test determines ove destruction characteristics of climiter fuses XGS-08566	B68-10424  B68-10424  B68-10156  B68-10258  I mode ay  B68-10306  tive  B68-10342  B68-10012  erload current  B68-10364	01 01 01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selectory dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devious LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data process GSFC-10576  PUNCHES Versatile impact hand tool M-FS-20140  PURGING Between-bearing shaft seal, a concept M-FS-18179  PUSH-PULL AMPLIFIERS Low-cost, fast-response drive circuit electromagnetic torque motors	B68-10225 ctive B68-10564 ice B68-10319 constant B68-10351 ssor B68-10336 B68-10371 t B68-10286 t for	02 01 03 01 05
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time delimeasurement M-FS-14323  PULLING Indium adhesion provides quantita measure of surface cleanliness SAN-10024  PULSE AMPLITUDE One-shot pulse shaper circuit XGS-11379  Nondestructive test determines oved destruction characteristics of limiter fuses XGS-08566  PULSE CODE MODULATION Portable Pulse Code Modulation /Pomsc-11369	B68-10424  B68-10424  B68-10156  B68-10258  I mode  B68-10306  tive  B68-10342  B68-10012  erload current  B68-10364	01 01 01 01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selectory dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devious LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data process GSFC-10576  PUNCHES Versatile impact hand tool M-FS-20140  PURGING Between-bearing shaft seal, a concept M-FS-18179  PUSH-PULL AMPLIFIERS Low-cost, fast-response drive circuit electromagnetic torque motors LEWIS-10143  Fluidic analog amplifier	B68-10225 ctive B68-10564 ice B68-10319 constant B68-10351 ssor B68-10336 B68-10371 t B68-10286 t for	02 01 03 01 05
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dels measurement M-FS-14323  PULLING Indium adhesion provides quantita measure of surface cleanliness SAN-10024  PULSE AMPLITUDE One-shot pulse shaper circuit XGS-11379  Nondestructive test determines ove destruction characteristics of climiter fuses XGS-08566  PULSE CODE MODULATION Portable Pulse Code Modulation /PomsC-11369	B68-10424  B68-10424  B68-104258  I mode  B68-10306  tive  B68-10342  B68-10012  erload current  B68-10364  CM/ B68-10106	01 01 01 01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selectory dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring deviolated to selectory devicted and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data process GSFC-10576  PUNCHES Versatile impact hand tool M-FS-20140  PURGING Between-bearing shaft seal, a concept M-FS-18179  PUSH-PULL AMPLIFIERS Low-cost, fast-response drive circuit electromagnetic torque motors LEWIS-10143  Fluidic analog amplifier ERC-10102	B68-10225 ctive B68-10564 ice B68-10319 constant B68-10351 ssor B68-10336 B68-10336 t for B68-10286 t for	02 01 03 01 05 05
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time delimeasurement M-FS-14323  PULLING Indium adhesion provides quantita measure of surface cleanliness SAN-10024  PULSE AMPLITUDE One-shot pulse shaper circuit XGS-11379  Nondestructive test determines oved destruction characteristics of limiter fuses XGS-08566  PULSE CODE MODULATION Portable Pulse Code Modulation /Pomsc-11369	B68-10424  B68-10424  B68-104258  I mode  B68-10306  tive  B68-10342  B68-10012  erload current  B68-10364  CM/ B68-10106	01 01 01 01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-select carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devince LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data process GSFC-10576  PUNCHES Versatile impact hand tool M-FS-20140  PURGING Between-bearing shaft seal, a concept M-FS-18179  PUSH-PULL AMPLIFIERS Low-cost, fast-response drive circuit electromagnetic torque motors LEWIS-10143  Fluidic analog amplifier	B68-10225 ctive B68-10564 fice B68-10319 constant B68-10351 ssor B68-10336 B68-10336 t for B68-10286 t for B68-10386 B68-10386	02 01 03 01 05 05
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time delimeasurement M-FS-14323  PULLING Indium adhesion provides quantitameasure of surface cleanliness SAN-10024  PULSE AMPLITUDE One-shot pulse shaper circuit XGS-11379  Nondestructive test determines oved destruction characteristics of limiter fuses XGS-08566  PULSE CODE MODULATION Portable Pulse Code Modulation /PomsC-11369  PULSE DURATION Shock and vibration response of m	B68-10424  B68-10424  B68-104258  I mode  B68-10306  tive  B68-10342  B68-10012  erload current  B68-10364  CM/ B68-10106	01 01 01 01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selec carbon dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring devi LEWIS-10446  PUMICE Thermal conductivity and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data proces GSFC-10576  PUNCHES Versatile impact hand tool M-FS-20140  PURGING Between-bearing shaft seal, a concept M-FS-18179  PUSH-PULL AMPLIFIERS Low-cost, fast-response drive circuit electromagnetic torque motors LEWIS-10143  Fluidic analog amplifier ERC-10102  PYROLYSIS Fire retardant foams developed to suf fuel fires	B68-10225 ctive B68-10564 ice B68-10319 constant B68-10351 ssor B68-10336 B68-10336 t for B68-10286 t for B68-10386 B68-10538	02 01 03 01 05 05
electron reactions with peptides proteins ARG-10195  PROTOTYPES Precision bolometer bridge MSC-11473  PSEUDONOISE Acquisition of pseudonoise signals sequential estimation M-FS-13898  Communication system features dua range acquisition plus time dels measurement M-FS-14323  PULLING Indium adhesion provides quantita measure of surface cleanliness SAN-10024  PULSE AMPLITUDE One-shot pulse shaper circuit XGS-11379  Nondestructive test determines ov destruction characteristics of limiter fuses XGS-08566  PULSE CODE MODULATION Portable Pulse Code Modulation /Po MSC-11369  PULSE DURATION Shock and vibration response of m structure	### B68-10424  ### B68-10424  ### B68-10424  ### B68-10258  ### B68-10306  #### B68-10306  #### B68-10342  #### B68-10342  #### B68-10364  #### B68-10106  #################################	01 01 01 01 01	Laser system used for dynamic balanci gyros M-FS-12218  Repetitively pulsed, wavelength-selectory dioxide laser ERC-10178  PULSES Ultrasonic temperature measuring deviolated to selectory discards and dielectric of silicate materials M-FS-14856  PUNCHED CARDS Fully automatic telemetry data process GSFC-10576  PUNCHES Versatile impact hand tool M-FS-20140  PURGING Between-bearing shaft seal, a concept M-FS-18179  PUSH-PULL AMPLIFIERS Low-cost, fast-response drive circuit electromagnetic torque motors LEWIS-10143  Fluidic analog amplifier ERC-10102  PYROLYSIS Fire retardant foams developed to suffuel fires	B68-10225 ctive B68-10564 fice B68-10319 constant B68-10351 ssor B68-10336 B68-10336 t for B68-10286 t for B68-10386 B68-10386	02 01 03 01 05 05

PYROMETERS Detection of effect of deposits on o	optical		Superconductive thin film makes con- liquid helium level sensor	venient	
windows of pyrometer measurements LEWIS-10366	B68-10367	01	LANGLEY-10289	B68-10341	01
PYROTECHNICS			Thermal conductivity and dielectric of silicate materials		0.7
Pyrotechnic device provides one-shot heat source LEWIS-10131	B68-10062	03	M-FS-14856	B68-10351	03
Pyrotechnic-actuated cable release	20001-0002	03	RADAR ANTENNAS		
XNP-10849	B68-10535	05	Structural thermal-control coatings NPO-10785	B68-10553	03
Q FACTORS			RADAR TRACKING Thermal conductivity and dielectric	constant	
Active RC networks of low sensitivity integrated circuit transfer functions synthesis			of silicate materials M-FS-14856	B68-10351	03
ARC-10146	B68-10210	01	RADIAL FLOW  Dynamics of moving bubbles in single	e and	
QUALITATIVE ANALYSIS Vibration testing and dynamic studie	es of		binary component systems M-FS-14845	B68-10339	02
relays M-FS-14542	B68-10268	01	Radial inflow turbine design charts		
QUALITY CONTROL			LEWIS-10720	B68-10567	05
Computer magnetic tape rehabilitation GSFC-10283	B68-10035	05	RADIANT COOLING Graphite cloth facilitates vacuum evaporation of silicon monoxide		
Inspection criteria ensure quality of parallel gap soldering			M-FS-14764	B68-10256	03
M-FS-14530	B68-10257	05	RADIANT FLUX DENSITY Automatic solar lamp intensity cont	rol	
Standards for compatibility of print circuit and component lead materia M-FS-14531		01	system XGS-10017	B68-10399	01
Automatic, nondestructive test monif		01	Plume radiation program M-FS-13202	B68-10447	06
in-process weld quality M-FS-14996	B68-10333	01	RADIATION	<b></b>	
Nondestructive test determines over destruction characteristics of cur			Improved atomic resonance gas cell : in frequency standards MSC-11666	B68-10230	01
limiter fuses XGS-08566	B68-10364	01	Analysis of annular combustors		
Consolidation and fabrication techni			LEWIS-10399	B68-10356	06
for vanadium-20 w/o titanium /TV-2 ARG-10148	B68-10368	03	RADIATION ABSORPTION  Coolants with selective optical fil- characteristics for ruby laser ap	plications	••
Training manuals for nondestructive using magnetic particles	. =		M-FS-20188	B68-10508	02
M-FS-20187	B68-10391	03	RADIATION COUNTERS Four pi-recoil proportional counter	used as	
Nondestructive testing of brazed roo engine components M-FS-18191	B68-10394	03	neutron spectrometer ARG-10101	B68-10326	02
Environmental test planning, select			RADIATION DETECTORS Improved relay optical element for		
and standardization aids available SAN-10028		06	spectroradiometer using cryogenic cooled detector	ally	
Electronic component reliability and		00	MSC-11688	B68-10245	02
by data reduction system NPO-10243	B68-10507	05	Automatic solar lamp intensity contr system	rol	
Failure rates for accelerated accept		•	XGS-10017	B68-10399	01
testing of silicon transistors ERC-10198	B68-10541	01	Readout system for radiation detect MSC-90180	or B68-10501	01
QUANTITATIVE ANALYSIS			RADIATION EFFECTS		
Microprobe investigation of brittle segregates in aluminum MIG and TIC M-FS-14720	3 welds B68-10334	03	Deep gamma ray penetration in thick M-FS-14388	shields B68-10143	02
Indium adhesion provides quantitativ	ve		Deflection circuit monitors force of under water	•	
measure of surface cleanliness SAN-10024	B68-10342	01	NUC-10147	B68-10147	01
QUARTZ			Radiation effects on bacterial cell ARG-10064	s B68-10169	04
Technique developed for measuring transmittance of optical birefring networks	gent		Susceptibility of irradiated steels	to	
networks M-FS-14267	B68-10260	02	hydrogen embrittlement ARG-10115	B68-10194	03
Preparation of silver-activated zind	sulfide		Study of radiation effects on mamma	lian cells	
GSFC-10687	B68-10271	03	in vitro ARG-10191	B68-10294	20

Effects of surface preparation on q of aluminum alloy weldments M-FS-13152	uality B68-10302	03	MSC-11656 RADIO FREQUENCIES	B68-10151	01
Experimental study and evaluation of			Mm-wave power meter mount NPO-10348	B68-10152	01
radioprotective drugs ARG-10196	B68-10320	04	Electrocardiograph transmitted by R telephone links in emergency situ		
CIRCUSA digital computer program transient analysis of electronic	circuits	06	FRC-10031  System converts optical phase chang	B68-10233	01
M-FS-15002  Rate constants measured for hydrate		06	RF phase changes M-FS-20091	B68-10430	01
electron reactions with peptides proteins	and		RADIO FREQUENCY INTERFERENCE		
ÂRG-10195	B68-10424	04	Improved S/N meter MSC-11656	B68-10151	01
Plume radiation program M-FS-13202	B68-10447	06	RADIO TRANSMITTERS Automatic patient respiration failu	ıre	
Hydrogen peroxide etching proves us germanium			detection system with wireless tr ARC-10174	ransmission B68-10365	01
ARG-10170	B68-10454	03	RADIOACTIVE ISOTOPES		
RADIATION MEASURING INSTRUMENTS General computer program for calculof radiation from inhomogeneous,	nonisobaric,	,	Detection sensitivities in 3-8 MeV neutron activation ARG-10210	B68-10298	02
nonisothermal rocket exhaust plum M-FS-14314	B68-10044	06	An economical method for the conting production of iodine-123	ເພວນຮ	
RADIATION PROTECTION  Contamination control handbook			LEWIS-10518	B68-10433	03
M-FS-20185	B68-10392	03	RADIOACTIVE MATERIALS Improved electromechanical master-s	s lave	
RADIATION SHIELDING Graphite cloth facilitates vacuum			manipulator ARG-10027	B68-10372	05
evaporation of silicon monoxide M-FS-14764	B68-10256	03	RADIOBIOLOGY  Ceric and ferrous dosimeters show p	orecision	
Isotopically pure magnesium isotope prepared from magnesium-24 oxide	e-24 is		for 50-5000 rad range ARG-10173	B68-10426	20
ARG-10154	B68-10293	02	An economical method for the contin	nuous	
Miniaturized King furnace permits absorption spectroscopy of small		0.2	production of iodine-123 LEWIS-10518	B68-10433	03
ARG-10177	B68-10418	02	RADIOGRAPHY  Evaluation of methods for nondestr	nativo	
RADIATION SOURCES Silicon surface barrier detectors liquid hydrogen density measurem			testing of brazed joints ARG-90175	B68-10191	03
M-FS-14115	B68-10166	01	X-ray film holder permits single		
RADIATION THERAPY  Experimental study and evaluation a radioprotective drugs	of		continuous picture of tubing joint LEWIS-10382	nt B68-10343	05
ARG-10196	B68-10320	04	Improved radiographic image amplif M-FS-14522	ier panel B68-10363	02
RADIATION TOLERANCE Improved radiographic image amplif		••	Nondestructive testing of brazed r	ocket	
M-FS-14522 Stratification of centrifuged amoe	B68-10363	02	engine components M-FS-18191	B68-10394	03
investigated by electron microsc		04	RADIOMETERS Properties of optics at high tempe	rature and	
RADIATIVE HEAT TRANSFER			their measurement, a study M-FS-14696	B68-10240	02
Thermal conductivity and dielectri of silicate materials		07	RAFTS	me after	
M-FS-14856	B68-10351	03	Pneumatic raft automatically refor rupture of buoyant member MSC-11562	ms arter B68-10011	05
High-emittance coatings on metal s LEWIS-10325	ubstrates B68-10381	03	RANDOM ERRORS	P00 1001f	00
RADII			Study of optimum discrete estimato	rs in	
Gimbal angle sensor GSFC-10305	B68-10315	01	measurement analysis M-FS-14915	B68~10348	02
RADIO ANTENNAS Single degree of freedom antenna p program /ANTENA/			RANDOM PROCESSES Random access-random release relay switching matrix		
NPO-10756	B68-10449	06	M-FS-12590	B68-10301	01
RADIO ASTRONOMY  Thermal conductivity and dielectri of silicate materials	c constant		Study of optimum discrete estimato measurement analysis M-FS-14915	B68-10348	02
M-FS-14856	B68-10351	03	RANDOM VARIABLES		
RADIO FILTERS Improved S/N meter			Independent doubly truncated gamma M-FS-20143	variables B68-10345	02

RANGE (EXTREMES) SUBJECT INDEX

RANGE (EXTREMES)			READOUT		
Method for reducing snap in magneti	c		Amplitude and frequency readout over	lay	
amplifiers			GSFC-10183		01
LEWIS-10388	B68-10388	01			
DANGERTHE			Random access-random release relay		
RANGEFINDING Communication system features dual	mode		switching matrix M-FS-12590	B68-10301	01
range acquisition plus time delay			N 15 12030	DOO 10001	0.1
measurement	· /		Improvement in recording and reading	r	
M-FS-14323	B68-10306	01	holograms	,	
			ERC-10151	B68-10347	02
RARE EARTH ELEMENTS					
Crystal structure analysis of inter	metallic		Readout systém for radiation detecto		0.1
compounds ARG-10092	B68-10198	03	MSC-90180	B68-10501	01
ARG 10032	DOG 10130	0.5	RECEIVERS		
RAY TRACING			Improved phase locked loop receiver		
FORTRAN optical lens design program	n		GSFC-09561	B68-10008	01
NPO-10603	B68-10354	06			
			Diversity RF receiving system with		
RAYLEIGH SCATTERING			improved phase-lock characteristic		0.1
Improvement in recording and reading holograms	ıg		XGS-01222	B68-10068	01
ERC-10151	B68-10347	02	Two-way digital driver/receiver uses	one	
200 20202	200 200		set of lines		
RC CIRCUITS			ERC-10055	B68-10437	01
Active RC networks of low sensitive					
integrated circuit transfer func-	tion		RECOIL PROTONS		
synthesis	DC0-10210	0.1	Four pi-recoil proportional counter	used as	
ARC-10146	B68-10210	01	neutron spectrometer ARG-10101	B68-10326	02
Active RC filter permits easy trade	e-off		ANG 10101	DOG 10020	02
of amplifier gain and sensitivity			RECOMBINATION REACTIONS		
ARC-10042	B68-10539	01	Axisymmetric reacting gas nonequilib	rium	
			performance program		
REACTANCE			MSC-11781	B68-10377	06
Moebius resistor is noninductive an nonreactive	ıa		RECORDING		
SAN-10020	B68-10267	01	Improvement in recording and reading	•	
DIM 10000	200 10001	0.1	holograms	,	
REACTION KINETICS			ERC-10151	B68-10347	02
Axisymmetric reacting gas nonequil	ibrium				
performance program			RECORDING INSTRUMENTS		
MSC-11781	B68-10377	06	Recharge unit provides for optimum		
Titanium-nitrogen reaction investi	rated for		recharging of battery cells GSFC-10688	B68-10273	01
application to gettering systems	gutou roi		03.0 10000	200 202.0	•-
ARG-10208	B68-10414	03	RECTIFIERS		
	_		Feasibility study of wireless power		
Rate constants measured for hydrate			transmission systems	D C 0 _ 1 0 7 0 0	0.1
electron reactions with peptides proteins	and		M-FS-14691	B68-10309	01
ARG-10195	B68-10424	04	RECURSIVE FUNCTIONS		
			New technique for optimal smoothing	of data	
REACTION TIME			MSC-11354	B68-10060	02
Reaction rates of graphite with oze	one				
measured by etch decoration ARG-10086	B68-10101	03	Study of optimum discrete estimators measurement analysis	3 1 N	
AND 10000	DOO TOTOL	03	M-FS-14915	B68-10348	02
Cryogenic liquid level measuring pr	robe				•
ARG-10138	B68-10291	01	REDUCTION (CHEMISTRY)		
			Metabolic and toxicological effects		
System measures response time of			water-soluble xenon compounds are		0.4
photomultiplier tubes	B68-10382	01	ARG-90239	B68-10076	04
LEWIS-10437	DOO 10002	<b>01</b>	Improved fuel-cell-type hydrogen sei	nso <b>r</b>	
Method for making small pointed			M-FS-14656	B68-10263	01
thermocouples					1
SAN-10014	B68-10389	01	Isotopically pure magnesium isotope-	-24 is	-
Dragaton Hilbrid			prepared from magnesium-24 oxide	D.CO. 1.0007	
REACTION WHEELS Gimbal angle sensor			ARG-10154	B68-10293	02
GSFC-10305	B68-10315	01	REDUNDANT COMPONENTS		
			SEAL /Subnetwork Enumeration And		
REACTIVITY			Listing/		
Improved process for making thin-f	ilm sodium		ERC-10116	B68-10227	06
nichata compaitema	DC0 -10167	0.1	DEPARTY GUTEI DING		
niobate capacitors	B68-10163	01	REENTRY SHIELDING  Fire retardant foams developed to su	innrege	
MSC-11231					
MSC-11231			fuel fires	••	
			fuel fires ARC-10098	B68-10358	03
MSC-11231  REACTOR MATERIALS  Deflection circuit monitors force under water	on object		ARC-10098	B68-10358	03
MSC-11231  REACTOR MATERIALS  Deflection circuit monitors force		01	ARC-10098 REFLECTANCE		03
MSC-11231  REACTOR MATERIALS  Deflection circuit monitors force under water  NUC-10147	on object	01	ARC-10098  REFLECTANCE Optical integrating sphere operates		03
MSC-11231  REACTOR MATERIALS  Deflection circuit monitors force under water  NUC-10147  READERS	on object B68-10147	01	ARC-10098  REFLECTANCE  Optical integrating sphere operates  visible and infrared wavelengths	at	
MSC-11231  REACTOR MATERIALS  Deflection circuit monitors force under water  NUC-10147	on object B68-10147	01	ARC-10098  REFLECTANCE Optical integrating sphere operates		03
MSC-11231  REACTOR MATERIALS  Deflection circuit monitors force under water  NUC-10147  READERS  Long-term data storage and retriev	on object B68-10147	01	ARC-10098  REFLECTANCE  Optical integrating sphere operates  visible and infrared wavelengths	at B68-10126	

cooled detector MSC-11688	B68-10245	02	RELEASING Pyrotechnic-actuated cable release XNP-10849	B68-10535 (	05
Detection of effect of deposits on windows of pyrometer measurements LEWIS-10366		01	RELIABILITY  Application of a truncated normal fa	ailure	
Structural thermal-control coatings	3	0.7	distribution in reliability testin M-FS-14328	ng	20
NPO-10785  Correction for losses in optical	B68-10553	03	Temperature or pressure controller LEWIS-10297	B68-10337 (	01
birefringent networks, a concept M-FS-20088	B68-10571	02	RELIABILITY ENGINEERING Electronic component reliability and	alysis	
REFLECTING TELESCOPES Improved electro-optical tracking s M-FS-14791	system B68-10311	01	by data reduction system NPO-10243	B68-10507	05
			Failure rates for accelerated accept	t ance	
REFLECTION Fluidic-thermochromic display device ERC-10031	e 868-10350	01	testing of silicon transistors ERC-10198	B68-10541	01
Automotic custom condentantinolis	:+		RELIEF VALVES  Vent and relief valve maintains low		
Automatic system nondestructively and records fatigue crack growth LANGLEY-10091		01	leakage rate over broad temperatum M-FS-12807		05
REFRACTION			Device damps fluid pressure oscillat	tions in	
FORTRAN optical lens design program NPO-10603	B68-10354	06	vent valve M-FS-13290		05
REFRACTORIES			Proposed gas generation assembly wo	ald	
Laser Doppler gas-velocity instrume M-FS-20039	ent B68-10349	02	recover deeply submerged objects SAN-10007		05
REFRACTORY MATERIALS Decomposition vessel GSFC-10343	B68-10104	03	Dual rate pressure relief valve MSC-11606	B68-10237	05
	DOC 10104	00	REMOTE CONTROL		
REFRACTORY METALS Survey made of refractory metals LEWIS-10380	B68-10032	03	Portable, high intensity isotopic no source provides increased experime accuracy		
Improved torch increases weld qual	ity in		ARG-90250		02
refractory metals LEWIS-324	B68-10041	05	Remotely operated gripper provides v control rod movement ARG-10160		05
Tungsten fiber-reinforced nickel so LEWIS-10424	uperalloy B68-10369	03	Improved electromechanical master-s		0.5
Inverted grounding technique for e			manipulator ARG-10027		05
beam heating LEWIS-10543	B68-10411	01	Pyrotechnic-actuated cable release	200 10555	٥.
Precise doping of metals by small	nas flows		XNP-10849	B68-10535	05
LEWIS-10444 REINFORCED PLASTICS	B68-10526	03	Welding skate with computerized con- M-FS-20224		01
Fiberglass-reinforced structural material for aerospace application	aterials		REMOTE HANDLING Remotely installed pipe plug provide	es	
M-FS-14806	B68-10360	03	effective seal in hazardous environ NUC-10303	onment	05
REINFORCEMENT (STRUCTURES)  Method for reinforcing tubing join	+ ~		Random access-random release relay		
MSC-11108	B68-10115	05	switching matrix M-FS-12590	B68-10301	01
REINFORCING FIBERS Tungsten fiber-reinforced nickel s	unonallou		RENE 41		
LEWIS-10424	B68-10369	03	Heat treatment procedure to increas		
RELATIONSHIPS			ductility of degraded nickel allo M-FS-12410		03
Theory of a refined earth model M-FS-14679	B68-10228	02	Pre-weld heat treatment improves we	lds in	
			Rene 41		
RELAXATION TIME One-dimensional reacting gas nonequ	uilibrium		M-FS-18174	B68-10285	03
performance program			REPETITION	• •	
MSC-11777  One-dimensional two-phase reacting		06	Transistorized Marx bank pulse circ provides voltage multiplication w nanosecond rise-time	ith	
nonequilibrium performance progr MSC-11780	am B68-10376	06	ARG-10110	B68-10328	01
	700-14910	vo	REPORTS		
RELAY Improved relay optical element for			JPKWIC - General key word in contex subject index report generator		
spectroradiometer using cryogenic cooled detector	cally		NPO-10589	B68-10208	06
MSC-11688	B68-10245	02	REPRODUCTION Study of radiation effects on mamma in vitro	lian cells	

ARG-10191	B68-10294	02	measure respiration rates accurate adverse environments	ly in	
REPRODUCTION (COPYING)				B68-10188	01
Shortened procedure for obtaining reproducible copies of 35 mm community KSC-09957		02	Nosepiece respiration monitor ERC-10136	B68-10438	01
RESEARCH FACILITIES	/		RESPIROMETERS		
Hydrogen safety manual LEWIS-10487	B68-10323	01	Nosepiece respiration monitor	B68-10438	01
RESERVOIRS	_		RETAINING		
Dynamic-reservoir lubricating de M-FS-14652	vice B68-10261	05	High-temperature bearing-cage materi LEWIS-10403	als B68-10176	05
RESIDUAL STRESS Electrochemical cell has interna	1		RETENTION Study of behavior of sterols at inte	<b>nf</b> 2000	
heater element				B68-10281	03
GSFC-10358	B68-10325	01	REYNOLDS NUMBER		
Nondestructive method for measur stresses in metals, a concept	ing residual		Venturi meter with separable diffuse LEWIS-10483	r B68-10295	05
KSC-10237	B68-10378	03	RHENIUM		
RESILIENCE			Reinforced thermal-shock resistant c		
Fiberglass prevents cracking of polyurethane foam insulation o	n cryogenic		LEWIS-10376	B68-10085	03
vessels M-FS-20058	B68-10406	02	Fabrication techniques developed for diameter, thin-wall tungsten and t		
RESINS	D00-10400	UZ	alloy tubing	B68-10284	05
High-temperature bearing lubrica					•••
LEWIS-10408	B68-10249	05	Nickel base alloy with improved stre rupture properties	88	
RESISTANCE Studies in zirconium oxidation			LEWIS-10283	B68-10344	03
ARG-10099	B68-10199	03	RHENIUM ALLOYS Tungsten-rhenium alloy thermocouples		
Welder analyzer MSC-12068	B68-10242	01	effective for high-temperature mea		03
Low energy ohmmeter can be used			RING STRUCTURES		
sensitive circuits, other mete SAN-10013	rs B68-10269	01	Mass loading effects on vibrated rin shell structures	g and	
RESISTANCE HEATING			M-FS-14979	B68-10532	03
Isotopically pure magnesium isot			RINGS	1	
prepared from magnesium-24 oxi ARG-10154	B68-10293	02	Shock-absorbing caster wheel is simp compact		
RESISTANCE THERMOMETERS			SAN-10019	B68-10266	05
Viscosity and density of methano mixtures at low temperatures	l/water		ROCKET-BORNE PHOTOGRAPHY Rocket engine nozzle photographic		
M-FS-14991	B68-10274	03	system	B68-10113	02
RESISTORS				100-10115	UL
Gyrator-type circuits replace un inductors	grounded		ROCKET ENGINE DESIGN Rocket engine analog simulation		
XAC-10608	B68-10084	01		B68-10511	01
Moebius resistor is noninductive	and		ROCKET ENGINES		
nonreactive SAN-10020	B68-10267	01	Two-fluid, impinging-sheet injector NPO-10547	B68-10338	05
RESOLUTION			Rocket engine analog simulation		
Circuit enhances vertical resolu raster scanning systems	tion in		M-FS-14511	B68-10511	01
MSC-12123	B68-10121	01	ROCKET EXHAUST  General computer program for calcula	tion	
Improved gas ring laser MSC-11584	B68-10304	20	of radiation from inhomogeneous, n nonisothermal rocket exhaust plume M-FS-14314		06
RESONANCE	** ***				-
Improved atomic resonance gas ce in frequency standards	II for use		Infrared spectroradiometer for rocke exhaust analysis	τ	
MSC-11666	B68-10230	01	M-FS-14357	B68-10081	02
RESOURCES	4:		Plume radiation program	B68-10447	06
Computer program conducts facili utilization and occupancy surv NPO-10438		06	M-FS-13202 ROCKS	70010441	vo
	B00-10191	VO	Preparing rock powder specimens of		
RESPIRATORY IMPEDANCE Automatic patient respiration fa	ilure		controlled size distribution NPO-10007	B68-10297	05
detection system with wireless ARC-10174		01	RODS		
		01	Fiberglass-reinforced structural mat	erials	
RESPIRATORY RATE High- and low-pressure pneumotac	hometers		for aerospace application M-FS-14806	B68-10360	03

ROLL FORMING Roll diffusion bonding of titanium	allou		RUBY LASERS Laser system used for dynamic balanc	ing of	
panels	ullog		gyros	ing of	
M-FS-14743	B68-10161	05	M-FS-12218	B68-10225	05
ROLLER BEARINGS  Bearings use dry self-lubricating c materials	age		Coolants with selective optical filt characteristics for ruby laser app M-FS-20188		20
LEWIS-10432	B68-10165	05	11 15 20100	200 10000	02
			RUNGE-KUTTA METHOD		
ROLLING CONTACT LOADS High-temperature bearing lubricants LEWIS-10408	B68-10249	05	One-dimensional reacting gas nonequi performance program MSC-11777	B68-10375	-06
	DOG 10245	00	1100 11777	200 10070	••
ROOM TEMPERATURE Encapsulation technique eliminates		•	RUPTURING Preumatic raft automatically reforms	after	
stresses in welded electronic mod M-FS-14581	ules B68-10307	01	rupture of buoyant member MSC-11562	B68-10011	05
ROTATING BODIES			_		
Between-bearing shaft seal, a conce		0.5	S S		
M-FS-18179	B68-10286	05	SADDLES (SUPPORTS)  Vertical boring mill capacity is inc	reased	
Improved gas ring laser				B68-10530	05
MSC-11584	B68-10304	02			
High-speed pulse camera			SAFETY Ambient temperature catalyst for hyd	irogen	
MSC-11353	B68-10329	02	ignition	ii ogen	
			LEWIS-10551	B68-10520	03
ROTATING CYLINDERS			SAFETY DEVICES		
X-ray film holder permits single continuous picture of tubing join	ıt		Saran film is fire-retardant in oxyg	ien	
LEWIS-10382	B68-10343	05	atmosphere		
g			MSC-11604	B68-10177	03
Compact rotating cup anemometer NPO-10563	B68-10436	01	Thermal protective visor for entering	ıa	
M 5 1000	200 10100	• •	high temperature areas	-9	
ROTATING MIRRORS			MSC-10285	B68~10277	05
High-speed camera synchronization M-FS-18062	B68-10282	02	Solid state high-voltage pulser oper	rates	
N 13-10002	500 10202	02	with low supply voltage	4100	
ROTATING SHAFTS			M-FS-14034	B68-10308	01
Spiral-grooved shaft seals substant	ially		SAFETY FACTORS	•	
reduce leakage and wear LEWIS-10397	B68-10270	05	Quick-attach clamp		
			XFR-05421	B68-10250	05
Miniature paint-spray gun for reces	ssed		I are annual about the second to the	t+	
areas MSC-13060	B68-10387	05	Low energy ohmmeter can be used to to sensitive circuits, other meters	iesi	
			SAN-10013	B68-10269	01
ROTATING STALLS			Undanger or fater manual		
Cooled miniature pressure transduce effective at high temperatures	: ۲3	•	Hydrogen safety manual LEWIS-10487	B68-10323	01
LEWIS-10401	B68-10370	. 01			
TOTAL TOW			Chemistry laboratory safety manual		
ROTATION Swing arm carrier protects flexible	lines		available SAN-10030	B68-10419	03
during test item rotation					••
MSC-11464	B68-10037	05	SAMPLERS		
Gimbal angle sensor			Vacuum probe sampler removes micron- particles from surfaces	-sized	
GSFC-10305	B68-10315	01	SAN-10003	B68-10231	04
ROTORS  Shallow grooves in journal improve	ain		SAMPLING  The X square statistic and goodness	of fit	
bearing performance	air		test	01 111	
LEWIS-10396	B68-10134	05	GSFC-10547	B68-10136	02
Laser system used for dynamic balar	aina ce		Droposing mock random assainess of		
gyros	terng or		Preparing rock powder specimens of controlled size distribution		
M-FS-12218	B68-10225	05	NPD-10007	B68-10297	05
A			Patture with a few resultanesses assess		
Acoustic wave analysis M-FS-18076	B68-10265	02	Failure rates for accelerated accept testing of silicon transistors	Lance	
			ERC-10198	B68-10541	01
RUBBER			CANDUTCH CEDUCATIONS		
X-ray film holder permits single continuous picture of tubing join	nt		SANDWICH STRUCTURES Shock-absorbing caster wheel is sim	ole and	
LEWIS-10382	B68-10343	05	compact		
Districtive			SAN-10019	B68-10266	05
RUBIDIUM Improved atomic resonance gas cell	for use		Thermal protective visor for enteri	nα	
in frequency standards	101 436		high temperature areas		
MSC-11666	B68-10230	01	MSC-10285	B68-10277	05
RUBY			SAPPHIRE		
Improved traveling wave maser ampli	ifier		Indium adhesion provides quantitation	ve	
NPO-10548	B68-10244	01	measure of surface cleanliness		
			SAN-10024	B68-10342	01

SATELLITE INSTRUMENTS Charts designate probable future oceanographic research fields			SAN-10007 SEALERS	B68-10211	05
M-FS-20202	B68-10397	01	Inspection criteria ensure quality of parallel gap soldering	control	
SATELLITE TRANSMISSION Fully automatic telemetry data proc	essor		M-FS-14530	B68-10257	05
GSFC-10576	B68-10336	01	Electron beam selectively seals por filters	rous metal	
SATURN LAUNCH VEHICLES Accurate digital technique simulate	s fliaht		LEWIS-10162	B68-10331	05
control system M-FS-14787	B68-10569	oʻ2	Cooled miniature pressure transduce effective at high temperatures LEWIS-10401	B68-10370	01
SATURN 5 LAUNCH VEHICLES  New method for critical failure pre	diction		SEALING	200 20070	
of complex systems M-FS-14133	B68-10252	02	Heat-shrink plastic tubing seals jo glass tubing	oints in	
Improved technique for digital simu	lation		LEWIS-10329	B68-10040	05
of bending and slosh phenomena M-FS-14788	B68-10570	02	Inspection criteria ensure quality of parallel gap soldering M-FS-14530	B68-10257	05
SCALE (RATIO)  Fast method for obtaining scale dim	ongione				05
on tape-controlled milling machin MSC-11609		05	Electron beam selectively seals por filters LEWIS-10162	B68-10331	05
SCALE MODELS			Hydrostatic testing of porous assem	mblies	
High-torque precision stepping driv M-FS-14772	e B68-10549	05	M-FS-18298	B68-10439	05
SCALERS			SEALS (STORPERS) Asbestos and Inconel combined to for	orm hot-gas	
Digital filter suppresses effects on mu nonstatistical noise bursts on mu			seal M-FS-14004	B68-10162	05
scaler digital averaging systems ARG-90143	B68-10193	06	Spiral-grooved shaft seals substant	tially	
SCALING Locating and sealing air leaks in			reduce leakage and wear LEWIS-10397	B68-10270	05
multiroomed buildings NUC-10304	B68-10024	05	Between-bearing shaft seal, a conce M-FS-18179	ept B68-10286	05
SCANNERS Development of mechanized ultrasoni	c		Hand-tightened, high-pressure seal M-FS-18416	B68-10417	05
scanning system M-FS-13638	B68-10004	05	Evaluation of a fluorocarbon plast	ic used	
Circuit enhances vertical resolution	n in		in cryogenic valve seals M-FS-18189	B68-10523	03
raster scanning systems MSC—12123	B68-10121	01	Tube joint leak repair coupling MSC-15022	B68-10540	05
Improved electro-optical tracking s M-FS-14791	ystem B68-10311	01	SELECTIVITY		05
System for measuring spatial distri ejected droplets, a concept	bution of		Study of behavior of sterols at int ARG-10085	B68-10281	03
NPO-10185	B68-10402	01	SELF SEALING Fire retardant foams developed to s	Sunnrass	
SCANNING Closed circuit TV system automatica	111y		fuel fires ARC-10098	B68-10358	03
guides welding arc M-FS-20084	B68-10357	01	SEMICONDUCTOR DEVICES	200 2000	
SCHEDULING	300 10001		Bilateral, zero-impedance static semiconductor switch		
Automatic planning concept - An ana optimum scheduling	lysis of		LEWIS-10129	B68-10118	01
M-FS-14198	B68-10127	06	Semiconductor ac static power swite LEWIS-10344	ch B68-10224	.≱ 01
DSN seven day/twelve week schedule NPO-10752	program B68-10410	06	Feasibility study of wireless power		*-
SCINTILLATION Tunnel diode circuit used as			transmission systems M-FS-14691	B68-10309	01
nanosecond-range time marker ARG-90164	B68-10173	01	CIRCUS-—A digital computer program transient analysis of electronic M-FS-15002		06
SCREEN EFFECT Luminescent screen composition for			SEMICONDUCTOR JUNCTIONS		
cathode ray tubes ERC—19	B68-10056	01	Pressure-sensitive bonded junction transducers ERC-10087	P69-10569	01
SCREWS				B68-10563	01
Quick-attach clamp XFR-05421 SEA WATER	B68-10250	05	SEMICONDUCTORS (MATERIALS) Silicon strain sensors enable press measurement at cryogenic temperat M-FS-14703		01
Proposed gas generation assembly wo recover deeply submerged objects	ould		Power consumption in acoustic ampli		ΛŢ
			. ono. consumption in doodstic dmpi		

## SUBJECT INDEX

under conditions of maximum stable GSFC-10067 E	gain 68-10327	01	Low-cost, fast-response drive circui electromagnetic torque motors		01
Temperature or pressure controller LEWIS-10297	368-10337	01	SERVOCONTROL		01
Electron beam recrystallization of an	norphous		Conceptual dead weight device to pro pressure calibration		
semiconductor materials LEWIS-10443 E	368-10556	SO		B68-10264	01
Reliable method for testing gross lea	aks in		Improved electromechanical master-sl manipulator		
semiconductor component packages ERC-10150	368-10562	01	ARG-10027	B68-10372	05
			Low friction servo valve LEWIS-10574	B68-10440	05
SENSITIVITY Liquid crystal calibrator				DOO 10440	
M-FS-14151	368-10221	03	Automatic calibration apparatus for telemetry systems		
Detection sensitivities in 3-8 MeV neutron activation			NPO-10560	B68-10514	01
	368-10298	02	Welding skate with computerized cont M-FS-20224	trols B68-10566	01
Temperature or pressure controller LEWIS-10297	368-10337	01	SERVOMECHANISMS Alternating current electromagnetic	servo	
SENSORS Improved fuel-cell-type hydrogen sens	sor		induction meter XFR-03838	B68~10100	01
	368-10263	01	Low-cost, fast-response drive circu	it for	
Gimbal angle sensor GSFC-10305 I	368-10315	01	electromagnetic torque motors LEWIS-10143	B68~10386	01
Ultrasonic temperature measuring devi	ice 368-10319	01	Digital laser-beam deflection sensor M-FS-14785	r B68~10525	01
Fluidic-thermochromic display device ERC-10031	868-10350	01	SERVOMOTORS  Concept for sleeve induction motor with the constant in the const	with	
System for measuring spatial distrib ejected droplets, a concept	ution of		ARG-10124	B68-10185	01
	868-10402	01	Improved electromechanical master-s manipulator		
SEPARATION Vibration testing and dynamic studies	s of		ARG-10027	B68-10372	05
relays	868-10268	01	SEX Experimental study and evaluation of	f	
Spiral-grooved shaft seals substanti			radioprotective drugs ARG-10196	B68-10320	04
reduce leakage and wear	B68-10270	05	SHAFTS (MACHINE ELEMENTS)		
SEPARATORS			Shallow grooves in journal improve a bearing performance	air	
Hydrostatic testing of porous assemb	lies B68-10439	05	LEWIS-10396	B68-10134	05
	000 10.00	••	Between-bearing shaft seal, a conce M-FS-18179	pt B68-10286	05
Separator for alkaline batteries GSFC-10173	B68-10557	03			00
SEQUENCING			Remotely operated gripper provides or control rod movement	vertical	
Computer program offers new method for constructing periodic orbits in no			ARG-10160	B68-10359	05
dynamical systems	B68-10217	06	SHAKERS  Shock and vibration response of mul	tistage	
		00	structure		
Parallel-to-serial biphase-data conv MSC-11600	erter B68-10241	01	M-FS-14972	B68-10353	05
Acquisition of pseudonoise signals b	ษ		SHEARS  Versatile impact hand tool		
sequential estimation M-FS-13898	B68-10258	01	M-FS-20140	B68-10371	05
Simultaneous message framing and err	or		SHEATHS  Design concept for nonarcing electr	ical	
detection	B68-10330	01	connector M-FS-14937	B68-10404	01
	200 20000	••			
SEQUENTIAL ANALYSIS Study of optimum discrete estimators measurement analysis	in		SHELL STABILITY Static structural analysis of shell structures	-type	
	B68-10348	02	MSC-11555	B68-10066	03
SEQUENTIAL COMPUTERS  Concept for simplified serial digita	1		Computer program analyzes Buckling Shells Of Revolution with various		
decoder		0.0	construction, BOSOR LANGLEY-10290	B68-10226	06
	B68-10045	06		700-10220	00
SERVOAMPLIFIERS Closed circuit TV system automatical	ly		SHELLS (STRUCTURAL FORMS)  Mass loading effects on vibrated ri	ng and	
guides welding arc	B68-10357	01	shell structures M-FS-14979	B68-10532	03

SHIELDING Mechanical shielding reduces weld : cracking in 6061 T6 aluminum			SIGNAL MIXING Improved communication system for l operations center	-	
MSC-11494	B68-10022	05	M-FS-15016	B68-10529	01
Rocket engine nozzle photographic system NPO-10174	B68-10113	02	SIGNAL PROCESSING Portable Pulse Code Modulation /PCM MSC-11369	/ B68-10106	01
X-ray film holder permits single continuous picture of tubing join LEWIS-10382	nt B68-10343	05	Analysis and design of a class-D am M-FS-14803	plifier B68-10313	01
SHIFT REGISTERS Parallel-to-serial biphase-data com MSC-11600	nverter B68-10241	01	SIGNAL TO NOISE RATIOS Improved phase locked loop receiver GSFC-09561	B68-10008	01
Acquisition of pseudonoise signals sequential estimation M-FS-13898	by B68-10258	01	Harmonic distortion analyzer speeds magnetic tape recorders GSFC-10198	setup of B68-10254	01
Simultaneous message framing and endetection MSC-12001		01	Acquisition of pseudonoise signals sequential estimation M-FS-13898	by B68–10258	01
Fluidic-thermochromic display device ERC-10031		01	Laser Doppler gas-velocity instrume M-FS-20039	B68-10349	02
SHOCK ABSORBERS Sleeved damper limits spring surging MSC-12071	ng B68-10111	05	Readout system for radiation detect MSC-90180 SILICATES	or B68-10501	01
Pressure variable orifice for hydra control valve MSC-11323	aulic B68-10120	05	Manganese-alumina-ceramic glass elimerigid controls necessary in bondimeto ceramics SAN-10012		03
Shock-absorbing caster wheel is sin	mple and		Thermal conductivity and dielectric		
SAN-10019	B68-10266	05	M-FS-14856	B68-10351	03
SHOCK RESISTANCE Reinforced thermal-shock resistant LEWIS-10376	ceramics B68-10085	03	SILICON Small, low power analog-to-digital converter M-FS-13954	B68-10016	01
SHOCK WAVE PROPAGATION  Shock and vibration response of mul	ltistage		Silicon solar cell monitors high te		-
structure M-FS-14972	B68-10353	05	furnace operation NUC-10163	B68-10148	01
SHORT CIRCUITS Current-limiting voltage regulator MSC-11824	B68-10305	01	Silicon strain sensors enable press measurement at cryogenic temperat M-FS-14703		01
SHOT PEENING  Nondestructive method for measuring stresses in metals, a concept	g residual		Temperature or pressure controller LEWIS-10297	B68-10337	01
KSC-10237 SIGNAL DISTORTION	B68-10378	03	Improved process for epitaxial depo- of silicon on prediffused substra M-FS-14910		03
Harmonic distortion analyzer speeds magnetic tape recorders GSFC-10198	868-10254	01	Electron beam recrystallization of a semiconductor materials	,	00
Improved communication system for in operations center	large		LEWIS-10443 SILICON ALLOYS	B68-10556	02
M-FS-15016 SIGNAL GENERATORS	B68-10529	01	Weld microfissuring in Inconel 718 minimized by minor elements M-FS-18185	B68-10251	.;≉ 03
Technique increases storage capacit camera tube target MSC-11599	ty in B68-10213	01	SILICON CARBIDES UV detector monitors organic contam		00
Harmonic distortion analyzer speeds magnetic tape recorders	•	•	of optical surfaces M-FS-20246	B68-10413	01
GSFC-10198  Acquisition of pseudonoise signals sequential estimation	B68-10254	01	Ambient temperature catalyst for hydignition LEWIS-10551	arogen B68-10520	03
M-FS-13898 High-speed camera synchronization	B68-10258	01	SILICON DIOXIDE Study of behavior of sterols at inte ARG-10085	erfaces B68-10281	03
M-FS-18062  Dynamic linearity measurement techn		02	Miniaturized King furnace permits absorption spectroscopy of small s		
KSC-10186  A 35 GHz solid state transmitter/di M-FS-20152	B68-10290 river B68-10545	01	ARG-10177  SILICON FILMS  Silicon oxide films grown in microwd discharge	B68-10418 ave	02

M-FS-14634	B68-10171	01	SINGLE CRYSTALS		
SILICON OXIDES			Indium adhesion provides quantitative measure of surface cleanliness	/e	
Silicon oxide films grown in microw	ave		SAN-10024	B68-10342	01
discharge M-FS-14634	B68-10171	01	SINTERING		
			Electron beam selectively seals porc	ous metal	
Graphite cloth facilitates vacuum evaporation of silicon monoxide			filters LEWIS-10162	B68-10331	05
M-FS-14764	B68-10256	03			
SILICON RADIATION DETECTORS			Grain growth inhibitor for porous to materials	ıngsten	
Silicon surface barrier detectors u			LEWIS-10535	B68-10527	03
liquid hydrogen density measurement M-FS-14115	nt B68-10166	01	Method for controlling density and		
	DOC 10100	0.1	permeability of sintered powdered		
SILICON TRANSISTORS  New microelectronic power amplifier			LEWIS-10393	B68-10528	03
M-FS-13621	B68~10073	01	SITES		
Failure rates for accelerated accep	tanca		Site survey for optimum location of Communication Experimental Facility		
testing of silicon transistors			M-FS-13155	B68-10050	06
ERC-10198	B68-10541	01	SIZE (DIMENSIONS)		
SILICONE RUBBER			High-torque power wrench, a concept		
Encapsulation technique eliminates stresses in welded electronic mod			M-FS-18194	B68-10299	05
M-FS-14581	B68-10307	01	SIZE DETERMINATION		
Dathany markers design annuides for	11		Flare angles measured with ball gage M-FS-14690	e B68-10030	01
Battery-package design provides for cooling and constraint	ceri		N-12-14030	200 10000	01
MSC-11839	B68-10398	05	SIZING SCREENS  Electroformed screens with uniform l	hole	
SILICONES			size		
Effects of surface preparation on q	uality		LEWIS-10117	B68-10107	05
of aluminum alloy weldments M-FS-13152	868-10302	03	SLEEVES		
Commonsible alesse mender automo	4:-		Tube swaging device uses explosive in LANGLEY-10092	force B68-10235	05
Compressible sleeve provides automa centering for grinding or turning			LANGLE I-10052	10200	00
cylinders	DC0 10710	05	Dual rate pressure relief valve	B68-10237	05
SAN-10021	B68-10318	05	MSC-11606		05
SILVER			Fabrication techniques developed for diameter, thin-wall tungsten and		
High-voltage pulse generator develowide-gap spark chambers	ped for		alloy tubing	tungsten	
ARG-10136	B68-10283	01	ARG-10100	B68-10284	05
Electromotive series established fo	r metals		Between-bearing shaft seal, a conce		
used in aerospace technology	DC0 10705		M-FS-18179	B68-10286	05
M-FS-18327	B68-10385	03	Compressible sleeve provides automa	tic	
Electrolytic silver ion cell steril	izes		centering for grinding or turning	of	
water supply MSC-11827	B68-10555	01	cylinders SAN-10021	B68-10318	05
CTI UPD COMOCINIDA			GI TRING		
SILVER COMPOUNDS  Preparation of silver-activated zin	c sulfide		SLIDING Dual rate pressure relief valve		
thin films GSFC-10687	BC0 10071	0.7	MSC-11606	B68-10237	05
GSFC-10687	B68-10271	03	SLIDING FRICTION		
SILVER NITRATES			Capacitance-coupled wiper increases	•	
Preparation of silver-activated zin thin films	c sullide		potentiometer life ARC-10060	B68-10175	01
GSFC-10687	B68-10271	03	GLID CAGRING		
SILVER ZINC BATTERIES			SLIP CASTING Tungsten fiber-reinforced nickel su	peralloy	
Separator for alkaline batteries	200 1055		LEWIS-10424	B68-10369	03
GSFC-10173	B68-10557	03	SLOTS		
SIMULATION			Tensile testing grips ensure unifor	m loading	
Simulated hailstone fabrication and testing weatherability of structu			of bimetal tubing specimens LEWIS-10267	B68-10248	05
NPO-10783	B68-10552	03			
SIMULATORS			Gimbal angle sensor GSFC-10305	B68-10315	01
Fully automatic telemetry data proc					
GSFC-10576	B68-10336	01	SLUDGE High-temperature bearing lubricants		
SINE WAVES	- <u>-</u>		LEWIS-10408	B68~10249	05
Vibration testing and dynamic studi relays	es of		SLURRIES		
M-FS-14542	B68-10268	01	Tungsten fiber-reinforced nickel su		
Modified sine bar device measures s	mall		LEWIS-10424	B68-10369	03
angles with high accuracy			Hydrostatic testing of porous assem		۰
GSFC-438	B68-10322	02	M-FS-18298	B68-10439	05

SODIUM Proposed gas generation assembly wo	ould		M-FS-14531	B68-10310	01
recover deeply submerged objects SAN-10007	B68-10211	05	Fixture facilitates soldering opera M-FS-14456	tions B68-10573	05
SODIUM ALLOYS			SOLENOIDS		
New bimetallic EMF cell shows promi direct energy conversion			High-torque power wrench, a concept M-FS-18194	B68-10299	05
ARG-10183	B68-10415	01	High-speed pulse camera		
SODIUM CHLORIDES			MSC-11353	B68-10329	02
Preparation of silver-activated zir	c sulfide		Temperature or pressure controller		
GSFC-10687	B68-10271	03	LEWIS-10297	B68-10337	01
Electromotive series established fo	r metals		SOLID LUBRICANTS		
used in aerospace technology M-FS-18327	B68-10385	03	Bearings use dry self-lubricating ca	age	
n-ra-10327	P00-10303	və	materials LEWIS-10432	B68-10165	05
A rapid stress-corrosion test for a	luminum				
alloys M-FS-20175	B68-10536	03	Application of the solid lubricant molybdenum disulfide by sputtering	a	
SODIUM COMPOUNDS			LEWIS-10544	B68-10340	03
Improved process for making thin-fi	lm sodium		SOLID STATE		
niobate capacitors			Electronic aperture control devised	for	
MSC-11231	B68-10163	01	solid state imaging system M-FS-12428	B68-10028	01
Detection sensitivities in 3-8 MeV				200 2002	
neutron activation ARG-10210	B68-10298	02	SOLID STATE DEVICES  Concept for sleeve induction motor (	with	
	200 10230	0.5	1-msec mechanical time constant		
SOLAR CELLS Silicon solar cell monitors high to	mnersture		ARG-10124	B68-10185	01
furnace operation	•		Solid state high-voltage pulser oper	rates	
NUC-10163	B68-10148	01	with low supply voltage M-FS-14034	B68-10308	01
Automatic solar lamp intensity conf	rol		n-r 5-14054	P00-10300	UI
system XGS-10017	B68-10399	01	Temperature or pressure controller LEWIS-10297	B68-10337	0.1
XG3-10017	D00-10399	01	LEW15-1029/	B68-10337	01
Electron beam recrystallization of semiconductor materials	amorphous		A 35 GHz solid state transmitter/dr M-FS-20152	iver B68-10545	01
LEWIS-10443	B68-10556	SO		DOD10343	01
SOLAR ENERGY			SOLIDIFICATION Nickel-base superalloy*s excellent		
Electrochemical cell has internal m	esistive		properties promote its service to	2200	
heater element GSFC-10358	B68-10325	01	degrees F LEWIS-10355	B68-10380	03
	200 10020	V-1		DOG 10000	00
SOLAR ORBITS Computer program for interplanetary	conic		SOLIDS  Bimetal sensor averages temperature	of	
patching			nonuniform profile		
M-FS-14296	B68-10033	06	LEWIS-10362	B68-10007	01
SOLAR RADIATION			Thermal conductivity and dielectric	constant	
Structural thermal-control coatings NPO-10785	B68-10553	03	of silicate materials M-FS-14856	B68-10351	03
	1000	•		200 10001	••
SOLAR SENSORS  Telescope dome control system autom	atically		SOLUBILITY Metabolic and toxicological effects	of	
tracks sun			water-soluble xenon compounds are		
MSC-10966	B68-10521	02	ARG-90239	B68-10076	04
SOLAR SIMULATORS			SOLUTION		
Automatic solar lamp intensity cont system	rol		Solution of differential equations of application of transformation grow		. 30
XGS-10017	B68-10399	01	M-FS-14802	B68-10276	02
SOLDERED JOINTS			SOLUTIONS		
Inspection criteria ensure quality	control		Electromotive series established for	r metals	
of parallel gap soldering M-FS-14530	B68-10257	05	used in aerospace technology M-FS-18327	B68-10385	03
	200 10207	00		DOG 10000	00
SOLDERING Thermal resistances of solder-boss,	/notting		SOLVENTS  Effects of surface preparation on qu		
compound combinations	potting		of aluminum alloy weldments	uaiity	
MSC-12074	B68-10157	01	M-FS-13152	B68-10302	03
Miniature pressure transducer for s	stressed		SOUND AMPLIFICATION		
member application MSC-11869	B68-10246	01	Noise figure measurement concept for acoustic amplifiers	r	
	-	0.1	GSFC-10066	B68-10272	01
Inspection criteria ensure quality of parallel gap soldering	control		Power consumption in acoustic ampli	fiere	
M-FS-14530	B68-10257	05	under conditions of maximum stable	e gain	
Standards for compatibility of prin	tad		GSFC-10067	B68-10327	01
circuit and component lead mater					
•					

SOUND TRANSMISSION  Flow tube used to cool solar-pumper laser	ed		fuel fires ARC-10098	B68-10358	03
MSC-11026 SDUND WAVES	B68-10010	02	SPACECRAFT TRACKING  Communication system features dual range acquisition plus time dela		
Acoustic wave analysis M-FS-18076	B68-10265	02 /	measurement M-FS-14323	B68-10306	01
SPACE COMMUNICATION  Deep space FM system, a concept  MSC-11825	B68-10289	01	SPACECRAFT TRAJECTORIES Internal velocity factors MSC-15002	B68-10403	06
SPACE EXPLORATION  Computer program for interplaneta: patching	ry conic		SPARK GAPS High-voltage pulse generator devel wide-gap spark chambers	loped for	
M-FS-14296	B68-10033	06	ARG-10136	B68-10283	01
SPACE FLIGHT FEEDING Food products for space application MSC-11697	ons B68-10324	04	Transistorized Marx bank pulse cir provides voltage multiplication nanosecond rise—time ARG—10110		01
SPACE RATIONS  Food products for space application MSC-11697	ons B68-10324	04	SPARK IGNITION Evaluation of ignition mechanisms		VI
SPACE STORAGE One-dimensional reacting gas noned	quilibrium		selected nonmetallic materials MSC-11645	B68-10167	03
performance program MSC-11777	B68-10375	06	SPATIAL DISTRIBUTION  System for measuring spatial distrespected droplets, a concept	ribution of B68-10402	01
SPACE SUITS Astronaut space suit communication MSC-12101	n antenna B68-10238	01	NPO-10185  SPECIFIC HEAT  Real fluid properties of normal an		0.1
SPACECRAFT Advances in light-gas gun technolo M-FS-14270	ogy B68-10288	05	parahydrogen LEWIS-10458	B68-10361	06
Study of optimum discrete estimate measurement analysis		00	SPECIFICATIONS Structural thermal-control coating NPO-10785	gs B68-10553	03
M-FS-14915 SPACECRAFT COMMUNICATION	B68-10348	02	SPECTRA  Detection sensitivities in 3-8 Me	J	
Design concept for a rapid automa- acquisition system NPO-10214	tic sync B68-10428	01	neutron activation ARG-10210	B68-10298	02
SPACECRAFT COMPONENTS Tube swaging device uses explosive LANGLEY-10092	e force B68-10235	05	SPECTRAL EMISSION Infrared spectroradiometer for roce exhaust analysis M-FS-14357	cket B68-10081	02
SPACECRAFT DOCKING		00	SPECTRAL ENERGY DISTRIBUTION		0.5
Fuel transfer system permits rapio coupling M-FS-91326	B68-10039	05	Imaging slitless spectrometer for astronomy M-FS-14309	X-ray B68-10546	90
SPACECRAFT ENVIRONMENTS Food products for space application			SPECTRAL REFLECTANCE Effects of surface preparation on	quality	
MSC-11697 SPACECRAFT MODELS	B68-10324	04	of aluminum alloy weldments M-FS-13152	B68-10302	03
High-torque precision stepping dr M-FS-14772	ive B68-10549	05	SPECTROMETERS  Low scatter lightweight fission s  constructed for biological rese	pectrometer arch B68-10174	20
SPACECRAFT POSITION INDICATORS Improved electro-optical tracking M-FS-14791	system B68-10311	01	ARG-10094  High resolution Ge /Li/ spectrome reduces rate-dependent distorti	ter	02
SPACECRAFT POWER SUPPLIES Zinc-oxygen primary cell yields h	igh		counting rates ARG-10144	B68-10420	01
energy density M-FS-14661	B68-10218	01	Nitric acid-organic mixtures surv use in separation by anion exch		03
Spiral-grooved shaft seals substa reduce leakage and wear LEWIS-10397	B68-10270	05	ARG-10065 Imaging slitless spectrometer for		03
SPACECRAFT PROPULSION High temperature alloy LEWIS-10377	B60-10057	03	astronomy M-FS-14309 SPECTROPHOTOMETERS	B68-10546	02
SPACECRAFT RELIABILITY	B68-10253	UJ	High-speed pulse camera MSC-11353	B68-10329	02
New method for critical failure p of complex systems M-FS-14133	B68-10252	02	SPECTRORADIOMETERS Improved relay optical element fo		
SPACECRAFT SHIELDING Fire retardant foams developed to	suppress		spectroradiometer using cryogen cooled detector MSC-11688	B68-10245	02

## SUBJECT INDEX

SPECTROSCOPY Miniaturized King furnace permits absorption spectroscopy of smal	l samples		XFR-05421 Vibration testing and dynamic stu	B68-10250 dies of	05
ARG-10177	B68-10418	02	relays M-FS-14542	B68-10268	01
SPECTRUM ANALYSIS Improved optical diffractometer MSC-12055	B68-10071	02	Contact-spring forming machine for conductor cable receptacles M-FS-20126	r flat B68-10550	05
Procedure developed for reporting fast-neutron exposure ARG-10035	B68-10190	02	SPUTTERING Application of the solid lubrican	<b>t</b> .	
Improved relay optical element for spectroradiometer using cryogen cooled detector			molybdenum disulfide by sputter LEWIS-10544	B68-10340	03
MSC-11688	B68-10245	02	Electron beam recrystallization of semiconductor materials LEWIS-10443	B68-10556	02
Laser Doppler gas-velocity instru M-FS-20039	ment B68-10349	02	STABILITY  Real fluid properties of normal a	nd	
SPEED CONTROL Automatic contour welder incorpora	ates		parahydrogen LEWIS-10458	B68-10361	06
speed control system M-FS-14574	B68-10091	01	STABILITY DERIVATIVES Computer program determines system	n	
SPHERES Optical integrating sphere operate visible and infrared wavelengths			stability /DIGSTA/ LEWIS-10395	B68-10216	06
M-FS-14248	B68-10126	02	STABILITY TESTS Computer program analyzes Buckling		
SPIRALS Spiral-grooved shaft seals substan reduce leakage and wear	ntially		Shells Of Revolution with various construction, BOSOR LANGLEY-10290	us wall B68-10226	06
LEWIS-10397	B68-10270	05			
SPONTANEOUS COMBUSTION Evaluation of ignition mechanisms	in		STABILIZATION  ELAS - A general purpose computer for the equilibrium problems of		
selected nonmetallic materials MSC-11645	B68-10167	03	structures NPO-10598	B68-10187	06
Saran film is fire-retardant in o	kygen		STAINLESS STEELS		
atmosphere MSC-11604	B68-10177	03	Decomposition vessel GSFC-10343	B68-10104	03
SPOT WELDS Miniature pressure transducer for	etroggod		Miniature pressure transducer for member application	stressed	
member application MSC-11869	B68-10246	01	MSC-11869	B68-10246	01
			Conceptual hermetically sealed elt	)OW	
Cooled miniature pressure transduce effective at high temperatures LEWIS-10401	B68-10370	01	actuator M-FS-14710	B68-10300	05
SPRAY NOZZLES Miniature paint-spray gun for rece	aged		Application of the solid lubricant molybdenum disulfide by sputter: LEWIS-10544		03
areas MSC-13060	B68-10387	05	Indium adhesion provides quantitat		0.5
SPRAYED COATINGS Miniature paint-spray gun for rece	essed		measure of surface cleanliness SAN-10024	B68-10342	01
areas MSC-13060	B68-10387	05	High-emittance coatings on metal s LEWIS-10325	substrates B68-10381	03
SPRAYERS System for measuring spatial distr	ribution of		Inverted grounding technique for e	electron	ria.
ejected droplets, a concept NPO-10185	B68-10402	01	LEWIS-10543 STAR TRACKERS	B68-10411	<b>0</b> 1
SPRAYING Fire retardant foams developed to fuel fires	suppress		Improved electro-optical tracking M-FS-14791	system B68-10311	01
ARC-10098	B68-10358	03	Telescope dome control system auto	omaticallý	
High-emittance coatings on metal s LEWIS-10325	substrates B68-10381	03	MSC-10966	B68-10521	20
SPRINGS (ELASTIC) Sleeved damper limits spring surgi	ing B68-10111	05	STARTERS Versatile impact hand tool M-FS-20140	B68-10371	05
Dual rate pressure relief valve			STATE VECTORS Study of optimum discrete estimate	ors in	
MSC-11606  Dynamically stable check valve cor	B68-10237	05	measurement analysis M-FS-14915	B68-10348	02
	P. IOI				
wide flow range M-FS-14579 Quick-attach clamp	B68-10247	05	STATIC ALTERNATORS  Semiconductor ac static power swit  LEWIS-10344	ch B68-10224	01

STATIC LOADS  Conceptual dead weight device to property of the	ovide		STEROIDS Study of behavior of sterols at inte ARG-10085		03
M-FS-14672 STATIC TESTS	B68-10264	01	STIFFNESS Computer program performs stiffness	matrix	
Effects of high frequency current i aluminum alloy 6061	-	,	structural analysis		06
M-FS-18337	B68-10383	05	STOCHASTIC PROCESSES		
STATISTICAL ANALYSIS  New method for critical failure pre of complex systems	diction		Design techniques - Stochastic contr MSC-11554	ollers B68-10234	20
M-FS-14133	B68-10252	20	STOICHIOMETRY Improved fuel-cell-type hydrogen sen		0.1
Study of optimum discrete estimator measurement analysis		00	M-FS-14656  Isotopically pure magnesium isotope-	B68-10263	01
M-FS-14915  Performance analysis of electrical	B68-10348	02	prepared from magnesium-24 oxide		02
/PANE/ M-FS-15001	B68-10448	06	The thermodynamic properties of the	wustite	
STATISTICAL CORRELATION The X square statistic and goodness	of fit		phase are studied ARG-10200	B68-10408	03
test			STORAGE		
GSFC-10547 STATISTICAL MECHANICS	B68-10136	02	Technique increases storage capacity camera tube target MSC-11599	y in B68-10213	01
Computer program for calculation of	ideal			500 10510	• •
gas thermodynamic data LEWIS-10254	B68-10025	06	STORAGE STABILITY Computer magnetic tape rehabilitation GSFC-10283	on study B68-10035	05
STATISTICS GERT EXCLUSIVE-OR combining paths a	nd .		STRAIN GAGES		
loops of electrical networks ERC-10206	B68-10435	06	Miniature pressure transducer for st member application		
GERT simulation program for GERT ne	twork		MSC-11869	B68-10246	01
analysis ERC-10209	B68-10457	06	Silicon strain sensors enable pressumeasurement at cryogenic temperatum-FS-14703	ure ures B68-10262	01
Failure rates for accelerated accep testing of silicon transistors	tance		Indium adhesion provides quantitativ	ur A	
ERC-10198	B68-10541	01	measure of surface cleanliness SAN-10024	B68-10342	01
STATOR BLADES Acoustic wave analysis			Nondestructive method for measuring	residual	
M-FS-18076	B68-10265	02	stresses in metals, a concept KSC-10237	B68-10378	оз
STATORS  Design eliminates radial thermal ex	pansion		Temperature controlled strain gaged		
in turbine stator components M-FS-18146	B68-10531	05	extensometer LEWIS-10353	B68-10543	01
STEAM FLOW Reaction studied of steam with niob	ium and		STRAIN RATE Evaluation of a fluorocarbon plastic	c used	
tantalum			in cryogenic valve seals		0.77
ARG-10051	B68-10189	03	M-FS-18189	B68-10523	03
STEEL STRUCTURES  Modified sine bar device measures s angles with high accuracy	small		STRATIFICATION  Stratification of centrifuged amoebating investigated by electron microscop		
GSFC-438	B68-10322	02	ARG-10161	B68-10366	04
STEELS			STRENGTH		
High-temperature bearing-cage mater LEWIS-10403	ials B68-10176	05	Weld microfissuring in Inconel 718 minimized by minor elements M-FS-18185	B68-10251	03
Susceptibility of irradiated steels	s to				-
hydrogen embrittlement ARG-10115	B68-10194	03	Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing	r small- tungsten	
Astronaut space suit communication MSC-12101	antenna B68-10238	01	ARG-10100	B68-10284	. 05
High-temperature bearing lubricants			STRESS ANALYSIS  Development of biaxial test fixture		
LEWIS-10408	B68-10249	05	includes cryogenic application M-FS-14185	B68-10070	01
STEREOPHOTOGRAPHY Stereo photomacrography system			Experiments with ceramic coatings		
LANGLEY-10176	B68-10141	01	M-FS-18150	B68-10355	03
STERILIZATION  Flectrolytic silver ion cell steril	11709		Nondestructive method for measuring stresses in metals, a concept	residual	
Electrolytic silver ion cell steril water supply			KSC-10237	B68-10378	03
MSC-11827	B68-10555	01	STRESS CONCENTRATION	m loading	

of bimetal tubing specimens LEWIS-10267	B68-10248	05	temperatures from low current SAN-10004 B68-10223	01
STRESS CORROSION Study of crack initiation phenomen associated with stress corrosion			STRUTS Fiberglass-reinforced structural materials for aerospace application	
aluminum alloys M-FS-14283	B68-10153	03	M-FS-14806 B68-10360	03
Stress-corrosion characteristics of	of aluminum		SUBMERGED BODIES Ballast barge concept for underwater	
casting alloy M-45 M-FS-14817	B68-10184	03	structures KSC-10196 B68-10168	05
A rapid stress-corrosion test for alloys			Proposed gas generation assembly would recover deeply submerged objects	
M-FS-20175	B68-10536	03	SAN-10007 B68-10211	05
Stress-corrosion-induced property in aluminum alloys M-FS-20209	B68-10568	03	SUBROUTINES MOP /Matrix Operation Programs system/	
STRESS MEASUREMENT	210 11000		NPO-10429 B68-10005	06
Simple test for physical stability cryogenic tank insulation M-FS-12547	9 of B68-10048	03	HICOV /Newton-Raphson calculus of variation with automatic transversalities/ M-FS-14468 B68-10232	06
STRESSES Miniature pressure transducer for member application	stressed		FORTRAN optical lens design program NPD-10603 B68-10354	06
MSC-11869  Design eliminates radial thermal e	B68-10246	01	SUBSONIC FLOW Laser Doppler gas-velocity instrument M-FS-20039 B68-10349	02
in turbine stator components M-FS-18146	B68~10531	05	Modified Multhopp mean camber computer	72
STRONTIUM 90			program LANGLEY-10376 B68-10446	06
Silicon surface barrier detectors liquid hydrogen density measurem M-FS-14115		01	Modified Multhopp lifting surface loading program	
STRUCTURAL ANALYSIS	200 40400	-	LANGLEY-10375 B68-10452	06
Survey made of refractory metals LEWIS-10380	868-10032	03	SUBSTRATES  Ion plating technique improves thin film  denosition	
Computer program performs stiffnes structural analysis	ss matrix		SAN-10006 B68-10212	03
NPO-10502	B68-10096	06	Graphite cloth facilitates vacuum evaporation of silicon monoxide	
Fatigue of reinforced concrete bea dynamic loading M-FS-14980	B68-10515	05	M-FS-14764 B68-10256	03
STRUCTURAL DESIGN	D00-10313	VS	Improved radiographic image amplifier panel M-FS-14522 B68-10363	02
Study of crack initiation phenomer associated with stress corrosion aluminum alloys			High-emittance coatings on metal substrates LEWIS-10325 B68-10381	03
M-FS-14283	B68-10153	03	Improved process for epitaxial deposition of silicon on prediffused substrates	
Improved traveling wave maser ampl NPO-10548	B68-10244	01	M-FS-14910 B68-10390  Evaluation of superconducting magnets, a	03
Design of fluid-duct bends with lo pressure loss	ow.		study M-FS-14808 B68-10396	02
M-FS-20176	B68-10395	05	High dielectric thick films for screened	
Analysis of filament reinforced me pressure vessels LEWIS-10352	868-10405	06	circuit capacitors LANGLEY-10294 B68-10542	01
STRUCTURAL FAILURE	D00-10400	00	Electron beam recrystallization of amorphous semiconductor materials	
Predicting fatigue life of metal t M-FS-14096	B68-10026	05	LEWIS-10443 B68-10556	02
STRUCTURAL MEMBERS			SULFATES Ceric and ferrous dosimeters show precision	
Miniature pressure transducer for member application MSC-11869	B68-10246	01	for 50-5000 rad range ARG-10173 B68-10426	02
STRUCTURAL STABILITY	200 10240	~~	Coolants with selective optical filtering characteristics for ruby laser applications	
High temperature alloy LEWIS-10377	B68-10253	03	M-FS-20188 B68-10508	
Nickel-base superalloy*s excellent properties promote its service t			SULFIDES Study of mechanical properties of uranium compounds	
properties promote its service t degrees F LEWIS-10355	B68-10380	03	ARG-10074 B68-10197	03
STRUCTURAL WEIGHT Lightweight heater generates high	2-1 40000		SULFURIC ACID  Method for removing surface-damaged layers from nickel alloys	

SUBJECT INDEX SWITCHING CIRCUITS

M-FS-18151	B68-10522	03	centering for grinding or turning of cylinders	
SUPERCONDUCTING MAGNETS			SAN-10021 B68-10318	05
Evaluation of superconducting magnetic study	iets, a		Nondestructive method for measuring residual	
M-FS-14808	B68-10396	02	stresses in metals, a concept	
			KSC-10237 B68-10378	03
SUPERCONDUCTIVITY Superconducting switch permits mea	aurament	,	SURFACE LAYERS	
of small voltages at cryogenic t			Method for removing surface-damaged layers	
ARG-90260	B68-10087	01	from nickel alloys	
Our Institut Abit 621- auto-			M-FS-18151 B68-10522	03
Superconductive thin film makes co liquid helium level sensor	onventent		SURFACE PROPERTIES	
LANGLEY-10289	B68-10341	01	Effects of surface preparation on quality	
			of aluminum alloy weldments	
SUPERCONDUCTORS	_		M-FS-13152 B68-10302	03
Rectangular configuration improves superconducting cable	•		Indium adhesion provides quantitative	
ARG-90088	B68-10098	02	measure of surface cleanliness	
ga 1 40-3 a			SAN-10024 B68-10342	01
One hundred angstrom niobium wire LEWIS-10128	B68-10279	03	SURFACE REACTIONS	
TOWN TOTAL	200 10212	•••	Characteristics of fluidized-packed beds	
Evaluation of superconducting magn	nets, a		ARG-10049 B68-10278	03
study M-FS-14808	B68-10396	92	Study of behavior of sterols at interfaces	
M-12-14000	D00-10390	02	ARG-10085 B68-10281	03
SUPERHIGH FREQUENCIES				
Improved traveling wave maser amp		A-	SURFACE STABILITY	
NPO-10548	B68-10244	01	Nondestructive method for measuring residual stresses in metals, a concept	
SUPERSONIC AIRCRAFT			KSC-10237 B68-10378	03
Computer program analyzes and des				
supersonic wing-body combination		06	Improved process for epitaxial deposition of silicon on prediffused substrates	
ARC-10141	B68-10335	06	M-FS-14910 B68-10390	03
SUPERSONIC FLOW				
Laser Doppler gas-velocity instru		00	SURFACE TEMPERATURE	
M-FS-20039	B68-10349	02	Liquid crystal calibrator M-FS-14151 B68-10221	03
A mass flux probe for measurement	in a			
supersonic stream			SURFACES	
LEWIS-10695	B68-10533	02	Vacuum probe sampler removes micron-sized particles from surfaces	
SUPPORTS			SAN-10003 B68-10231	04
Clamp for detonating fuze				
M-FS-13399	B68-10072	05	Air Bearing Lift Pad /ABLP/ M-FS-14685 B68-10442	05
Mm-wave power meter mount			N-15-14000 B00 1014E	00
NPO-10348	B68-10152	01	SURGERY	
Compressible sleeve provides auto			Automatic patient respiration failure detection system with wireless transmission	
centering for grinding or turning			ARC-10174 B68-10365	
cylinders	_			
SAN-10021	B68-10318	05	SURGES Computer program TRACK performs transient	
Fiberglass-reinforced structural	materials		and/or steady state thermal analysis with	
for aerospace application			coupled fluid flow and heat conduction	
M-FS-14806	B68-10360	03	NUC-10189 B68-10450	06
Cooled miniature pressure transdu	rorq		Method for measuring alternator voltage	
effective at high temperatures			transients	
LEWIS-10401	B68-10370	01	LEWIS-10373 B68-10513	01
SURFACE CRACKS			Operational integrator	
Mechanical shielding reduces weld	surface		NPO-10230 B68-10547	01
cracking in 6061 T6 aluminum				
MSC-11494	B68-10022	05	SURVEYS Site survey for optimum location of Optical	
Effects of high frequency current	in welding		Communication Experimental Facility	
aluminum alloy 6061	-		M-FS-13155 B68-10050	06
M-FS-18337	B68-10383	05	SWAGING	
SURFACE DEFECTS			Tube swaging device uses explosive force	
Effect of surface irregularities	on bellows		LANGLEY-10092 B68-10235	05
fatigue life		65	CULTURALIDO	
M-FS-14480	B68-10229	05	SWITCHES Semiconductor ac static power switch	
SURFACE ENERGY			LEWIS-10344 B68-10224	01
Study of behavior of sterols at i				
ARG-10085	B68-10281	03	Superconductive thin film makes convenient liquid helium level sensor	
SURFACE FINISHING			LANGLEY-10289 B68-10341	01
Effects of surface preparation on	quality		•	•
of aluminum alloy weldments	DEG. 10700	0.7	SWITCHING CIRCUITS  Rilatoral Jamos Impedance Static	
M-FS-13152	B68~10302	03	Bilateral, zero-impedance static semiconductor switch	
Compressible sleeve provides auto	matic		LEWIS-10129 B68-10118	01
•				

SYMBOLIC PROGRAMMING SUBJECT INDEX

Analysis and design of a class-D ar M-FS-14803	mplifier B68-10313	01	absorption spectroscopy of small ARG-10177	samples B68-10418	02
High-efficiency step-up regulator M-FS-20049	B68-10432	01	TAPE RECORDERS Analysis of flutter in tape transpo	rt	
SYMBOLIC PROGRAMMING			systems M-FS-11970	B68-10027	01
Symbolic reduction of block diagram	ms using		11 15 11510	200 10021	•
FORMAC			Magnetic tape transport controlled	bу	
LEWIS-10409	B68-10423	06	rotating transducer heads GSFC-483	B68-10079	01
SYNCHRONISM			0010 400	500 10015	•-
Synchronized circuit improves accur	racy of		Harmonic distortion analyzer speeds	setup of	
fluid transfer measurements MSC-11167	B68-10057	05	magnetic tape recorders GSFC-10198	B68-10254	01
inde TITO	DOO-10001	00	651 6 10196	DOO 10204	01
Acquisition of pseudonoise signals	by		TAPERING		
sequential estimation M-FS-13898	B68-10258	01	Machining technique prevents underc in tensile specimens	utting	
15 1555	10200	U1	LANGLEY-10281	B68-10352	05
High-speed camera synchronization					
M-FS-18062	B68-10282	02	TARGET ACQUISITION  Communication system features dual	mode .	
SYSTEMS ENGINEERING			range acquisition plus time delay		
Hydrogen safety manual			measurement		
LEWIS-10487	B68-10323	01	M-FS-14323	B68-10306	01
Design concept for a rapid automat	ic sync		Improved electro-optical tracking s	ystem	
acquisition system			M-FS-14791	B68-10311	01
NPO-10214	B68-10428	01	Single degree of freedom antenna po	intina	
Radial inflow turbine design charts	s		program /ANTENA/		
LEWIS-10720	B68-10567	05	NPO-10756	B68-10449	06
SYSTOLE			TEFLON (TRADEMARK)		
Cardiac R-wave detector			Vacuum probe sampler removes micron	-sized	
LEWIS-10394	B68-10144	01	particles from surfaces SAN-10003	B68-10231	04
eige				200 10001	• •
TABLEC (DATA)			TELECOMMUNICATION	1	
TABLES (DATA) Solving nonlinear heat transfer co	nstant		Acquisition of pseudonoise signals sequential estimation	оy	
area fin problems			M-FS-13898	B68-10258	01
M-FS-14851	B68-10504	02	a		
Failure rates for accelerated acce	otance		Communication system features dual range acquisition plus time delay		
testing of silicon transistors	•		measurement		
ERC-10198	B68-10541	01	M-FS-14323	B68-10306	01
TACHOMETERS			TELEMETRY		
High- and low-pressure pneumotachor			Simultaneous message framing and er	ror	
measure respiration rates accura adverse environments	tely in		detection MSC-12001	B68-10330	01
FRC-10012	B68-10188	01			
TANGENTS			Fully automatic telemetry data proc GSFC-10576		0.1
Thermal conductivity and dielectric	c constant		GSF C-10376	B68-10336	01
of silicate materials		_	Design concept for a rapid automati	c sync	
M-FS-14856	B68-10351	03	acquisition system NPO-10214	B68-10428	01
TANK GEOMETRY			NI 0 10217	DOD 10420	••
System for measuring roundness and			Automatic calibration apparatus for		
concentricity of large tanks M-FS-13362	B68-10099	05	telemetry systems NPO-10560	B68-10514	01
TANKS (CONTAINERS)  Portable, high intensity isotopic	neutron		TELEPHONES Electrocardiograph transmitted by R	Fand	. 1944
source provides increased experie			telephone links in emergency situ		¥
accuracy	DC0 100/F		FRC-10031	B68-10233	01
ARG-90250	B68-10243	02	TELESCOPES		
High-torque power wrench, a concep			Measuring thermal expansion of mult	iple	
M-FS-18194	B68-10299	05	specimens at high temperature NUC-10153	B68-10122	05
TANTALUM		•	100 10100	DOG TOTEL	•••
Isotopically pure magnesium isotope prepared from magnesium-24 oxide			Telescope dome control system autom tracks sun	atically	
ARG-10154	B68-10293	02	MSC-10966	B68-10521	02
Name and the second sec			m-1-1		
Nickel base alloy with improved structure properties	ress		Training manual on optical alignmen instruments	τ	
LEWIS-10283	B68-10344	03	M-FS-20292	B68-10574	02
Nickel-hase superallouse eventions			TELEVICION CAMEDAS		
Nickel-base superalloy*s excellent properties promote its service to			TELEVISION CAMERAS		
			Color-televised medical microscopu		
degrees F	o 2200	25	Color-televised medical microscopy MSC-13086	B68-10314	01
degrees F LEWIS-10355		03	MSC-13086	B68-10314	01
	o 2200	03			01

compounds ARG-10119	B68-10201	03	measurement at cryogenic temperatu M-FS-14703		01
Lithium-tellurium bimetallic cell ha increased voltage			Spiral-grooved shaft seals substanti reduce leakage and wear		
ARG-10141	B68-10400	01	LEWIS-10397	B68-10270	05
TELLURIUM COMPOUNDS Technological survey of tellurium an compounds	d its	e.	Fiberglass-reinforced structural mat for aerospace application M-FS-14806		03
ARG-10119	B68-10201	03	Effects of high frequency current in	welding	
TELLURIUM ISOTOPES An economical method for the continu	ous		aluminum alloy 6061 M-FS-18337		05
	B68-10433	03	Grain-boundary migration in KCl bicr ARG-10181		03
TEMPERATURE  Method of measuring thermal conducti  high performance insulation	vity of	•	Heat transfer coefficients for liqui hydrogen turbopumps	ı <b>d</b>	
	B68-10013	02	M-FS-18345	B68-10517	02
Cooled miniature pressure transducer	'3		Evaluation of a fluorocarbon plastic in cryogenic valve seals	: used	
effective at high temperatures LEWIS-10401	B68-10370	01	M-FS-18189	B68-10523	03
TEMPERATURE COMPENSATION Current-limiting voltage regulator MSC-11824	B68-10305	01	TEMPERATURE INVERSIONS  Technique developed for measuring transmittance of optical birefring	gent	
Acceleration insensitive fluid expan			networks M-FS-14267	B68-10260	02
compensator ERC-10152	B68-10559	01	TEMPERATURE MEASUREMENT Measuring thermal expansion of multi	iple	
TEMPERATURE CONTROL Pyrotechnic device provides one-shot	:		specimens at high temperature NUC-10153		05
heat source LEWIS-10131	B68-10062	03	Silicon solar cell monitors high ter	sperature	
Viscosity and density of methanol/wa mixtures at low temperatures	ater		furnace operation NUC-10163	B68-10148	01
	B68-10274	03	Real fluid properties of normal and parahydrogen		
Isotopically pure magnesium isotope- prepared from magnesium-24 oxide	-24 is	•	LEWIS-10458	B68-10361	06
ARG-10154	B68-10293	02	Detection of effect of deposits on o windows of pyrometer measurements		
Temperature or pressure controller LEWIS-10297	B68-10337	01	LEWIS-10366	B68-10367	01
Fluidic-thermochromic display device ERC-10031	B68~10350	01	Method for making small pointed thermocouples SAN-10014	B68-10389	01
Battery-package design provides for cooling and constraint	cell		Nondestructive testing of brazed ro- engine components		
MSC-11839	B68-10398	05	M-FS-18191	B68-10394	03
Temperature controlled strain gaged extensometer		0.1	Imaging slitless spectrometer for X- astronomy	-ray B68-10546	02
LEWIS-10353	B68-10543	01	M-FS-14309 TEMPERATURE MEASURING INSTRUMENTS	B00 -10040	UE
Structural thermal-control coatings NPO-10785	B68-10553	03	Bimetal sensor averages temperature nonuniform profile		01
TEMPERATURE DISTRIBUTION Graphite cloth facilitates vacuum evaporation of silicon monoxide			LEWIS-10362  Thin film heat transfer gage is sta	B68-10007	0.1
M-FS-14764	B68-10256	03	at higher temperatures M-FS-12396	B68-10051	01
Dynamics of moving bubbles in single binary component systems M-FS-14845	e and B68-10339	02	Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059	s asurement B68-10109	03
Computer program TRACK performs trai and/or steady state thermal analy- coupled fluid flow and heat condu-	sis with	06	Ultrasonic temperature measuring de LEWIS-10446	vice B68-10319	01
NUC-10189  Solving nonlinear heat transfer con			TEMPERATURE SENSORS Temperature or pressure controller		
area fin problems  M-FS-14851	B68-10504	02	LEWIS-10297	B68-10337	01
TEMPERATURE EFFECTS	_00 10001		Fluidic transducer gives pressure o function of temperature	utput as	
Resistivity measurements of neutron-irradiated pure metals an	d Al-Zn		ERC-10093	B68-10537	05
alloys ARG-10108	B68-10200	03	TEMPERING Improved thermal treatment of alumi	num	
Silicon strain sensors enable press	ure		alloy 7075 M-FS-20083	B68-10534	05

TEMPLATES  Machining technique prevents underd in tensile specimens	utting		instruments M-FS-20292	B68-10574	20
LANGLEY-10281	B68-10352	05	THERMAL CONDUCTIVITY  Method of measuring thermal conduct	ivity of	
TENSILE STRENGTH			high performance insulation	-	
Improved molding process ensures pl parts of higher tensile strength	lastic		M-FS-14088	B68-10013	20
LANGLEY-10033	B68-10132	05	Thermal conductivity and dielectric of silicate materials	constant	
Magnetic forming studies M-FS-14217	B68-10186	02	M-FS-14856	B68-10351	03
Susceptibility of irradiated steels	. +0		Fiberglass-reinforced structural ma- for aerospace application	terials	
hydrogen embrittlement ARG-10115	B68-10194	03	M-FS-14806	B68-10360	03
			Consolidation and fabrication techn		
Nickel base alloy with improved str rupture properties LEWIS-10283		0.7	for vanadium-20 w/o titanium /TV-7 ARG-10148	20/ B68-10368	03
FE#12-10502	B68-10344	03	High conductance vapor thermal swite	ch	
Nickel-base superalloy*s excellent properties promote its service to	2200		GSFC-10109	B68-10519	20
degrees F	DCC 10700		THERMAL ENERGY		
LEWIS-10355  Evaluation of a fluorocarbon plasti	B68-10380	03	Thermal protective visor for entering high temperature areas MSC-10285	ng B68-10277	05
in cryogenic valve seals M-FS-18189	B68-10523	03	THERMAL EXPANSION	000-10277	03
	200 10000	••	Measuring thermal expansion of mult	iple	
TENSILE STRESS			specimens at high temperature		
Tensile testing grips ensure unifor of bimetal tubing specimens	m loading		NUC-10153	B68-10122	05
LEWIS-10267	B68-10248	05	Design eliminates radial thermal ex in turbine stator components	pansion	
TENSILE TESTS  Tensile testing grips ensure unifor	m looding		M-FS-18146	B68-10531	05
of bimetal tubing specimens	in roading		THERMAL INSULATION		
LEWIS-10267	B68-10248	05	Multichip packaging with thermal in: M-FS-14076	sulation B68-10119	02
One hundred angstrom niobium wire LEWIS-10128	B68-10279	03	Temperature or pressure controller LEWIS-10297	B68-10337	01
Machining technique prevents under	utting		PEWID IOES!	DOG 10007	01
in tensile specimens LANGLEY-10281	B68-10352	05	Fire retardant foams developed to s	uppress	
LANGLEI-10201	000-10332	05	fuel fires ARC-10098	B68-10358	03
TERMINOLOGY					
Properties of optics at high temper their measurement, a study	ature and		Structural thermal-control coatings NPO-10785	B68-10553	03
M-FS-14696	B68-10240	02		200 20000	••
TEST CHAMBERS			THERMAL NOISE  Thermal short improves sensitivity	of	
Development of biaxial test fixture	<b>:</b>		cryogenically cooled maser	<b>31</b>	
includes cryogenic application M-FS-14185	D60-10070	01	NPO-09975	B68-10059	01
N-75-14109	B68-10070	01	THERMAL PROTECTION		
Automatic calibration system for pr	essure		Thermal protective visor for enteri	ng	
transducers M-FS-20127	B68-10412	01	high temperature areas MSC-10285	B68-10277	05
		-	•		••
Dual-purpose chamber-cooling system NPO-10467	B68-10506	02	Two-fluid, impinging-sheet injector NPO-10547	B68-10338	05
Reliable method for testing gross ]	eaks in		THERMAL RESISTANCE		
semiconductor component packages			Thermal resistances of solder-boss/	potting	
ERC-10150	B68-10562	01	compound combinations MSC-12074	B68-10157	01
TEST EQUIPMENT			HDC -12074	DOG 10157	01
Harmonic distortion analyzer speeds magnetic tape recorders	setup of		Nickel base alloy with improved stro	288	
GSFC-10198	B68-10254	01	LEWIS-10283	B68-10344	03
Conceptual dead weight device to property of the contract of t	ovide		THERMAL SHOCK Simple test for physical stability o	of	
M-FS-14672	B68-10264	01	cryogenic tank insulation	<b>,</b> ,	
Environmental test planning, select	ion		M-FS-12547	B68-10048	03
and standardization aids available			Reinforced thermal-shock resistant	ceramics	
SAN-10028	B68-10445	06	LEWIS-10376	B68-10085	03
TEST PILOTS			THERMAL STABILITY		
High- and low-pressure pneumotachon	neters		High-temperature bearing-cage mater	ials	
measure respiration rates accurat			LEWIS-10403	B68-10176	05
adverse environments FRC-10012	B68-10188	01	High-temperature bearing lubricants		25
THEODOLITES			LEWIS-10408	B68-10249	05
Training manual on optical alignmen	ıt				

THERMAL STRESSES  Encapsulation technique eliminates thermal  stresses in welded electronic modules		tantalum ARG-10051 B68-10189	03
M-FS-14581 B68-10 THERMIONIC CATHODES	0307 01	Real fluid properties of normal and parahydrogen LEWIS-10458 B68-10361	06
Application of the solid lubricant molybdenum disulfide by sputtering LEWIS-10544 B68-10	0340 03	THERMOELECTRIC GENERATORS Superconducting switch permits measurement of small voltages at cryogenic temperatures	
THERMIONIC DIODES Feasibility study of wireless power transmission systems		ARG-90260 B68-10087  New bimetallic EMF cell shows promise in	01
M-FS-14691 B68-10 THERMIONIC EMISSION	309 01	direct energy conversion ARG-10183 B68-10415	01
High-temperature thermionic emission microscope		THERMOLUMINESCENCE Readout system for radiation detector	
NPO-10584 B68-10	0516 01	MSC-90180 B68-10501 THERMOMETERS	01
Mm-wave power meter mount NPO-10348 B68-10	0152 01	Viscosity and density of methanol/water mixtures at low temperatures M-FS-14991 B68-10274	03
Automatic patient respiration failure		M-L2-14331 000-10274	03
detection system with wireless transmiss ARC-10174 B68-1(		Ultrasonic temperature measuring device LEWIS-10446 B68-10319	01
Nosepiece respiration monitor ERC-10136 B68-10	0438 01	THERMOSTATS High conductance vapor thermal switch GSFC-10109 B68-10519	02
THERMOCOUPLES		55. 5 1015	~-
Tungsten-rhenium alloy thermocouples effective for high-temperature measureme ARG-10059 B68-10		THICKNESS  Computer program performs frequency analysis of nonuniform turbine disk subjected to temperature gradients	
Ultrasonic temperature measuring device LEWIS-10446 B68-10	319 01	NUC-10301 B68-10006 THIN FILMS	06
Cooled miniature pressure transducers		Thin film heat transfer gage is stable	
effective at high temperatures LEWIS-10401 B68-10	370 01	at higher temperatures M-FS-12396 B68-10051	01
Method for making small pointed		Ion plating technique improves thin film	
thermocouples SAN-10014 B68-10	389 01	deposition SAN-10006 B68-10212	03
Heat-load simulator for heat sink design MSC-15170 B68-10	0510 02	Graphite cloth facilitates vacuum evaporation of silicon monoxide M-FS-14764 B68-10256	03
Temperature controlled strain gaged			
extensometer LEWIS-10353 B68-10	0543 01	Preparation of silver-activated zinc sulfide thin films GSFC-10687 B68-10271	03
Combination probe for airflow measurements LEWIS-10281 B68-10		Standards for compatibility of printed circuit and component lead materials	03
THERMODYNAMIC EQUILIBRIUM  ELAS - A general purpose computer program		M-FS~14531 B68-10310	01
for the equilibrium problems of linear structures NPO-10598 B68-1(	0187 06	Superconductive thin film makes convenient liquid helium level sensor LANGLEY-10289 B68-10341	01
Dynamics of moving bubbles in single and binary component systems M-FS-14845 B68-14	0339 02	Separator for alkaline batteries GSFC~10173 B68-10557	03
THERMODYNAMIC PROPERTIES Computer program for calculation of ideal		THIN WALLS  Fabrication techniques developed for small- diameter, thin-wall tungsten and tungsten	
gas thermodynamic data LEWIS-10254 B68-10	0025 06	alloy tubing ARG-10100 B68-10284	05
Computer programs for thermodynamic and transport properties of hydrogen NUC-10537 B68-10	0150 06	THIOLS  Experimental study and evaluation of	
Tube swaging device uses explosive force	J130 VO	radioprotective drugs ARG-10196 B68-10320	04
LANGLEY-10092 B68-10 The thermodynamic properties of the wusti		THORIUM OXIDES Tungsten fiber-reinforced nickel superalloy LEWIS-10424 B68-10369	03
phase are studied	0408 03	THREADS Thread cutting with 3-axis N/C milling	
THERMODYNAMICS		machine	
Study of cryogenic container thermodynamic during propellant transfer	ės .	LANGLEY-10017 B68-10055	06
M~FS-14310 B68-10		Tensile testing grips ensure uniform loading of bimetal tubing specimens	25
Reaction studied of steam with niobium and	1	LEWIS-10267 B68-10248	05

.

THREE DIMENSIONAL FLOW SUBJECT INDEX

Dakan tatan ari lashan dan babba		TIN OVIDER	
Determining gas leakage from bubble formations M-FS-14841 B68-103	93 05	TIN OXIDES Improved radiographic image amplifier panel M-FS-14522 B68-10363	02
THREE DIMENSIONAL FLOW Laser Doppler gas-velocity instrument		TIRES Shock-absorbing caster wheel is simple and	
M-FS-20039 B68-103	49 02	compact SAN-10019 B68-10266	05
THREE DIMENSIONAL MOTION  Computer program determines vibration in three-dimensional space of hydraulic line excited by forced displacements	s	TISSUES (BIOLOGY) Study of radiation effects on mammalian cells in vitro	
M-FS-12226 B68-101	59 06	ARG-10191 B68-10294	02
THRESHOLDS Transistorized Marx bank pulse circuit provides voltage multiplication with		Experimental study and evaluation of radioprotective drugs ARG-10196 B68-10320	04
nanosecond rise-time ARG-10110 B68-103	28 01	Method for making small pointed	
THROTTLING		thermocouples SAN-10014 B68-10389	01
Two-fluid, impinging-sheet injector NPO-10547 B68-103	38 05	TITANATES High-emittance coatings on metal substrates	
TIME CONSTANT Concept for sleeve induction motor with		LEWIS-10325 B68-10381	03
1-msec mechanical time constant ARG-10124 B68-101	85 01	TITANIUM Nickel base alloy with improved stress	
Moebius resistor is noninductive and		rupture properties LEWIS-10283 B68-10344	03
nonreactive SAN-10020 B68-102	67 01	Titanium-nitrogen reaction investigated for	
TIME FUNCTIONS		application to gettering systems ARG-10208 B68-10414	03
Application of a truncated normal failure distribution in reliability testing M-FS-14328 B68-101	79 02	TITANIUM ALLOYS Roll diffusion bonding of titanium alloy panels	
Computer program determines system stability /DIGSTA/		M-FS-14743 B68-10161	05
LEWIS-10395 B68-102	16 06	Consolidation and fabrication techniques for vanadium-20 w/o titanium /TV-20/	
Design techniques - Stochastic controllers MSC-11554 B68-102	34 02	ARG-10148 B68-10368	03
Study of optimum discrete estimators in measurement analysis		Tungsten fiber-reinforced nickel superalloy LEWIS-10424 B68-10369	03
M-FS-14915 B68-103	48 02	TOOLS  Tube dimpling tool assures accurate	
TIME LAG Communication system features dual mode		dip-brazed joints MSC-533 B68-10036	05
range acquisition plus time delay measurement		Tool reconstructs data input points	
M-FS-14323 B68-103	06 01	corresponding to first order output graph M-FS-18003 B68-10154	02
Transistorized Marx bank pulse circuit provides voltage multiplication with nanosecond rise—time		Versatile impact hand tool M-FS-20140 B68-10371	05
ARG-10110 B68-103	28 01	Coaxial cable stripper for confined areas	
TIME MEASUREMENT Communication system features dual mode		KSC-10167 B68-10444	05
range acquisition plus time delay measurement		Weld preparation tool for pipes and tubing KSC-09955 B68-10551	05
M-FS-14323 B68-103	06 01	Fixture facilitates soldering operations	
Ultrasonic temperature measuring device LEWIS-10446 B68-103	19 01	M-FS-14456 B68-10573	05,
TIME MEASURING INSTRUMENTS		TOPOLOGY GERT EXCLUSIVE-OR combining paths and	
Tunnel diode circuit used as nanosecond-range time marker	77 A1	loops of electrical networks ERC-10206 B68-10435	06
ARG-90164 B68-101	73 01	TORCHES	
TIME SIGNALS  Method of reducing time base error in		Improved torch increases weld quality in refractory metals LEWIS-324 B68-10041	05
digital magnetic recorders GSFC-10108 B68-103	17 01	Automatic contour welder incorporates	0.0
TIMING DEVICES  System measures arc energy dissipated in relay contact cycling		speed control system M-FS-14574 B68-10091	01
M-FS-14541 B68-103	12 01	Closed circuit TV system automatically guides welding arc	
TIN Inspection criteria ensure quality control		M-FS-20084 B68-10357	01
of parallel gap soldering M-FS-14530 B68-102	57 05	TOROIDS Solid state high-voltage pulser operates	
		botta state high voltage parset operates	

M-FS-14034	B68-10308	01	M-FS-15020	B68-10422	06
TORQUE			TRAJECTORY MEASUREMENT		
Magnetically controlled torque wro prevents overtorquing SAN-10002	B68-10209	05	Study of optimum discrete estimator: measurement analysis M-FS-14915	8 1N B68-10348	02
High-torque power wrench, a conce		,	TRAJECTORY OPTIMIZATION		
M-FS-18194	B68-10299	05	Generalized Newton-Raphson trajector optimization-generator 1	ry	
TORQUE MOTORS  Low-cost, fast-response drive circ	cuit for		M-FS-15020	B68-10422	06
electromagnetic torque motors LEWIS-10143	B68-10386	01	TRANSDUCERS Magnetic tape transport controlled	by	
TORQUEMETERS High-temperature bearing lubrican	ts		rotating transducer heads GSFC-483	B68-10079	01
LEWIS-10408 TOWED BODIES	B68-10249	05	System for measuring roundness and concentricity of large tanks M-FS-13362	B68-10099	05
Quick-attach clamp	200 10050	0.5			
XFR-05421 TOWING	B68-10250	05	Reliable, self-calibrating vibration transducer LANGLEY-89	n B68-10124	01
Quick-attach clamp XFR-05421	B68-10250	05	Color-televised medical microscopy		
TOXIC HAZARDS	000 10200	03	MSC-13086	B68-10314	01
Product identification techniques training aids for analytical ch			Ultrasonic temperature measuring de LEWIS-10446	vice B68-10319	01
SAN-10025	B68-10373	03			01
TOXICITY			Cooled miniature pressure transduce effective at high temperatures	rs	
Metabolic and toxicological effec water-soluble xenon compounds a			LEWIS-10401	B68-10370	01
ARG-90239	B68-10076	04	Automatic calibration system for pro	essure	
Experimental study and evaluation	of		transducers M-FS-20127	B68-10412	01
radioprotective drugs ARG~10196	B68-10320	04	Fluidic transducer gives pressure o	utput as	
TRACE ELEMENTS			function of temperature ERC-10093	B68-10537	05
Weld microfissuring in Inconel 71	8			B0010337	03
minimized by minor elements M-FS-18185	B68-10251	03	Fluidic analog amplifier ERC-10102	B68-10538	05
Ignition of binary alloys of uran ARG~10057	ium B68-10280	01	Welding skate with computerized con M-FS~20224	trols B68-10566	01
TRACERS	alimotian		TRANSFER FUNCTIONS	ean	
Fluorescent particles enable visu of gas flow	alization		Active RC networks of low sensitivi integrated circuit transfer funct		
M-FS-14583	B68-10259	02	synthesis ARC-10146	B68-10210	01
TRACHEA	1a				
Automatic patient respiration fai detection system with wireless ARC-10174		01	Method for reducing snap in magneti- amplifiers LEWIS-10388	B68-10388	01
	B00-10303	01			01
TRACKING (POSITION)  Communication system features dua range acquisition plus time del		-	Symbolic reduction of block diagram FORMAC LEWIS-10409	s using B68-10423	06
measurement M-FS-14323	B68-10306	01	TRANSFER ORBITS		
Closed circuit TV system automati			Generalized Newton-Raphson trajecto optimization-generator 1	гу	
guides welding arc	-		M-FS-15020	B68-10422	06
M-FS-20084	B68-10357	01	TRANSFERRING		
Telescope dome control system aut tracks sun	omatically		Vacuum-jacketed transfer line insta	llation	
MSC-10966	B68-10521	02	technique M-FS-14496	B68-10125	05
TRACKING NETWORKS			TRANSFORMATIONS (MATHEMATICS)		
Acquisition of pseudonoise signal sequential estimation	a ph	,	Solution of differential equations application of transformation gro		
M-FS-13898	B68-10258	01	M-FS-14802	B68-10276	02
TRAJECTORIES			Computer program analyzes and desig		
HICOV /Newton-Raphson calculus of variation with automatic transv	omealities/		supersonic wing-body combinations ARC-10141	B68-10335	06
M-FS-14468	B68-10232	06	· ·	200 10000	00
TRAJECTORY ANALYSIS			TRANSFORMERS  Compensation circuit improves opera	tion of	
Internal velocity factors MSC-15002	B68-10403	06	inductive coupling transformers M-FS-13801	B68-10129	01
		••			~.
Generalized Newton-Raphson trajec optimization-generator 1	tory		Solid state high-voltage pulser ope with low supply voltage	rates	

TRANSIENT RESPONSE SUBJECT INDEX

M-FS-14034	B68-10308	01	M-FS-14972	B68-10353	05
Concept to convert electric GSFC-10222	al power B68-10321	01	TRANSMITTANCE Detection of effect of deposits on		
TRANSIENT RESPONSE			windows of pyrometer measurements LEWIS-10366	B68-10367	01
Computer program determines stability /DIGSTA/ LEWIS-10395	system B68-10216	06	Correction for losses in optical birefringent networks, a concept		
Improved limiter for turn-o	n current		M-FS-20088	B68-10571	02
transient GSFC-10413	B68-10384	01	TRANSMITTER RECEIVERS Improved electro-optical tracking s M-FS-14791	ystem B68-10311	01
CIRCUSA digital computer transient analysis of ele M-FS-15002		06	TRANSMITTERS Multichannel implantable telemetry: ARC-10083	system B68-10065	01
TRANSISTOR AMPLIFIERS Solid state high-voltage pu	lser operates		Communication system features dual	mode	
with low supply voltage M-FS-14034	B68-10308	01	range acquisition plus time delay measurement		
TRANSISTOR CIRCUITS			M-FS-14323	B68-10306	01
Current-limiting voltage re MSC-11824	gulator B68-10305	01	A 35 GHz solid state transmitter/dr M-FS-20152	iver B68-10545	01
Transistorized Marx bank pu			TRANSPARENCE		
provides voltage multipli nanosecond rise-time ARG-10110	B68-10328	01	Projection transparencies from prin material M-FS-14608	B68-10112	01
Two-way digital driver/rece	iver uses one		Improved atomic resonance gas cell	for use	
set of lines ERC-10055	B68-10437	01	in frequency standards MSC-11666	B68-10230	01
TRANSISTORS			Fluorescent particles enable visual	ization	
Gyrator-type circuits repla inductors	_		of gas flow M-FS-14583	B68-10259	02
XAC-10608	B68-10084	01	Improved radiographic image amplifi		
Analysis and design of a cl M-FS-14803	ass-D amplifier B68-10313	01	M-FS-14522 TRANSPONDERS	B68-10363	20
Integrated metal transistor GSFC-90536	leads B68-10518	01	Communication system features dual range acquisition plus time delay measurement		
Pressure-sensitive bonded j transducers			M-FS-14323	B68-10306	01
ERC-10087	B68-10563	01	TRANSPORT PROPERTIES  Computer programs for thermodynamic	and	
TRANSIT TIME Ultrasonic temperature meas LEWIS-10446	uring device B68-10319	01	transport properties of hydrogen NUC-10537	B68-10150	06
TRANSITION METALS			High-speed pulse camera MSC-11353	B68-10329	02
Twin solution calorimeter of heats of formation of all temperatures			Real fluid properties of normal and parahydrogen		
ARG-10114	B68-10083	01	LEWIS-10458	B68-10361	06
TRANSITION POINTS Fabrication techniques deve diameter, thin-wall tungs			TRANSPORTATION Packaging criteria for transportati handling shock and vibration	on and	
alloy tubing ARG-10100	B68-10284	05	M-FS-13007	B68-10219	05
TRANSITS	100-10204	00	Computer graphics data conditioning M-FS-14695	B68-10296	06
Training manual on optical instruments	alignment		TRANSURANIUM ELEMENTS		*-
M-FS-20292	B68-10574	02	Nitric acid-organic mixtures survey use in separation by anion exchan ARG-10065		03
TRANSMISSION CIRCUITS Optimetric system facilitate and fluorometric measurem			TRAVELING WAVE MASERS	00-10420	00
NPO-10233	B68-10316	01	Thermal short improves sensitivity cryogenically cooled maser	of	
TRANSMISSION LINES Rectangular configuration i	mproves		NPO-09975	B68-10059	01
superconducting cable ARG-90088	B68-10098	02	Improved traveling wave maser ampli NPD-10548	fier B68-10244	01
Solid state high-voltage pu with low supply voltage M-FS-14034	ulser operates B68-10308	01	TRIGGER CIRCUITS High-speed camera synchronization M-FS-18062	B68-10282	02
TRANSMISSIVITY Shock and vibration response structure	se of multistage		Transistorized Marx bank pulse circ provides voltage multiplication w nanosecond rise—time		

ARG-10110	B68-10328	01	Heat transfer coefficients for liqui hydrogen turbopumps		
TRIODES Application of the solid lubricant molybdenum disulfide by sputtering			M-FS-18345  Design eliminates radial thermal exp		02
LEWIS-10544	B68-10340	0,3	in turbine stator components	B68-10531	05
TUMORS  Compound equation developed for pos	tnatal		TURBINES		
growth of birds and mammals ARG-10192	B68-10427	04	Design eliminates radial thermal exp in turbine stator components M-FS-18146		05
TUNGSTEN					0.5
Reinforced thermal-shock resistant LEWIS-10376	B68-10085	03		ements B68-10558	01
High temperature alloy LEWIS-10377	B68-10253	03	Radial inflow turbine design charts LEWIS-10720	B68-10567	05
Fabrication techniques developed for diameter, thin-wall tungsten and			TURBOMACHINERY Computer program calculates velociti	es and	
alloy tubing ARG-10100	B68-10284	05	streamlines in turbomachines	B68-10097	06
Application of the solid lubricant		. •	TURBULENCE		
molybdenum disulfide by sputterin LEWIS-10544	B68-10340	03	Fast-response cup anemometer feature cosine response		
Nickel base alloy with improved str	ess			B68-10202	01
rupture properties LEWIS-10283	B68-10344	03	TURBULENCE METERS  Laser Doppler gas-velocity instrumen M-FS-20039	t B68-10349	02
Nickel-base superalloy*s excellent properties promote its service to	2200		TURBULENT DIFFUSION		
degrees F LEWIS-10355	B68-10380	03	Characteristics of fluidized-packed ARG-10049	beds B68-10278	03
Grain growth inhibitor for porous t	ungsten		TWISTING		
materials LEWIS-10535	B68-10527	03	Improved electromechanical master-sl manipulator		0.5
Method for controlling density and			ARG-10027	B68-10372	05
permeability of sintered powdered LEWIS-10393	metals   B68-10528	03	U		
	DOD 10020	0.5			
TUNGSTEN ALLOYS	000 10020		ULTRAHIGH FREQUENCIES Improved traveling wave maser amplif		
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy			Improved traveling wave maser amplif NPO-10548	ier B68-10244	01
TUNGSTEN ALLOYS  Cobalt-tungsten, ferromagnetic  high-temperature alloy  LEWIS-10378	B68-10095	03	Improved traveling wave maser amplif NPO-10548 ULTRAHIGH VACUUM High-temperature thermionic emission	B68-10244	01
TUNGSTEN ALLOYS  Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me	B68-10095		Improved traveling wave maser amplif NPO-10548 ULTRAHIGH VACUUM High-temperature thermionic emission microscope	B68-10244	01
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378 Tungsten-rhenium alloy thermocouple	B68-10095		Improved traveling wave maser amplif NPO-10548 ULTRAHIGH VACUUM High-temperature thermionic emission microscope	B68-10244	
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed fo diameter, thin-wall tungsten and	B68-10095 es easurement B68-10109 or small-	03	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM  High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION  One hundred angstrom niobium wire	B68-10244	
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for	B68-10095 es easurement B68-10109 or small-	03	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property ch	B68-10244 B68-10516 B68-10279	01
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced nickel su	B68-10095 es assurement B68-10109 or small- tungsten B68-10284	03	Improved traveling wave maser amplif NPO-10548  ULTRAHIGH VACUUM High-temperature thermionic emission microscope NPO-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property ch in aluminum alloys	B68-10244 B68-10516 B68-10279	01
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed fo diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced nickel so LEWIS-10424	B68-10095 es esasurement B68-10109 or small- tungsten B68-10284	03	Improved traveling wave maser amplif NPO-10548  ULTRAHIGH VACUUM High-temperature thermionic emission microscope NPO-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property ch in aluminum alloys M-FS-20209  ULTRASONIC SOLDERING	B68-10244  B68-10516  B68-10279  anges  B68-10568	01
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced nickel st LEWIS-10424  TUNGSTEN CARBIDES Flare angles measured with ball gages	B68-10095 escasurement B68-10109 or small- tungsten B68-10284 eperalloy B68-10369	03 03 05	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM  High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property ch in aluminum alloys M-FS-20209  ULTRASONIC SOLDERING Inspection criteria ensure quality cof parallel gap soldering	B68-10244  B68-10516  B68-10279  anges  B68-10568	01 03
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced nickel su LEWIS-10424  TUNGSTEN CARBIDES Flare angles measured with ball gage M-FS-14690	B68-10095 es assurement B68-10109 or small- tungsten B68-10284 aperalloy B68-10369	03	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM  High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property ch in aluminum alloys M-FS-20209  ULTRASONIC SOLDERING Inspection criteria ensure quality c of parallel gap soldering M-FS-14530	B68-10244  B68-10516  B68-10279  anges  B68-10568	01
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced nickel statewis-10424  TUNGSTEN CARBIDES Flare angles measured with ball gage M-FS-14690  TUNNEL DIODES Tunnel diode circuit used as	B68-10095 escasurement B68-10109 or small- tungsten B68-10284 eperalloy B68-10369	03 03 05	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property ch in aluminum alloys M-FS-20209  ULTRASONIC SOLDERING Inspection criteria ensure quality c of parallel gap soldering M-FS-14530  ULTRASONIC TESTS Evaluation of methods for nondestruc	B68-10244  B68-10516  B68-10279  anges  B68-10568  control  B68-10257	01 03
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced mickel st LEWIS-10424  TUNGSTEN CARBIDES Flare angles measured with ball gage M-FS-14690  TUNNEL DIODES	B68-10095 escasurement B68-10109 or small- tungsten B68-10284 eperalloy B68-10369	03 03 05	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM  High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property ch in aluminum alloys M-FS-20209  ULTRASONIC SOLDERING Inspection criteria ensure quality c of parallel gap soldering M-FS-14530  ULTRASONIC TESTS Evaluation of methods for nondestructesting of brazed joints	B68-10244  B68-10516  B68-10279  anges  B68-10568  control  B68-10257	01 03
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced nickel statewis-10424  TUNGSTEN CARBIDES Flare angles measured with ball gas M-FS-14690  TUNNEL DIODES Tunnel diode circuit used as nanosecond-range time marker ARG-90164  Pressure-sensitive bonded junction	B68-10095 es assurement B68-10109 or small- tungsten B68-10284 eperalloy B68-10369 ge B68-10030	03 03 05 03	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property ch in aluminum alloys M-FS-20209  ULTRASONIC SOLDERING Inspection criteria ensure quality c of parallel gap soldering M-FS-14530  ULTRASONIC TESTS Evaluation of methods for nondestructesting of brazed joints ARG-90175  Automatic system nondestructively mo	B68-10244  B68-10516  B68-10279  langes  B68-10568  control  B68-10257  tive  B68-10191	01 03 03
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced nickel statewisten and LEWIS-10424  TUNGSTEN CARBIDES Flare angles measured with ball gage M-FS-14690  TUNNEL DIODES Tunnel diode circuit used as nanosecond-range time marker ARG-90164	B68-10095 es assurement B68-10109 or small- tungsten B68-10284 eperalloy B68-10369 ge B68-10030	03 03 05 03	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property ch in aluminum alloys M-FS-20209  ULTRASONIC SOLDERING Inspection criteria ensure quality c of parallel gap soldering M-FS-14530  ULTRASONIC TESTS Evaluation of methods for nondestructesting of brazed joints ARG-90175  Automatic system nondestructively mo and records fatigue crack growth	B68-10244  B68-10516  B68-10279  langes  B68-10568  control  B68-10257  tive  B68-10191	01 03 03
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced nickel surveys. LEWIS-10424  TUNGSTEN CARBIDES Flare angles measured with ball gas M-FS-14690  TUNNEL DIODES Tunnel diode circuit used as nanosecond-range time marker ARG-90164  Pressure-sensitive bonded junction transducers ERC-10087  TURBINE BLADES	B68-10095 esseasurement B68-10109 or small- tungsten B68-10284 uperalloy B68-10369 ge B68-10030 B68-10173	03 03 05 03 01	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property che in aluminum alloys M-FS-20209  ULTRASONIC SOLDERING Inspection criteria ensure quality cof parallel gap soldering M-FS-14530  ULTRASONIC TESTS Evaluation of methods for nondestructesting of brazed joints ARG-90175  Automatic system nondestructively mo and records fatigue crack growth LANGLEY-10091  Nondestructive testing of brazed roc	B68-10244  B68-10516  B68-10279  anges  B68-10568  control  B68-10257  ctive  B68-10191  cnitors  B68-10379	01 03 03
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced nickel statewis-10424  TUNGSTEN CARBIDES Flare angles measured with ball gas M-FS-14690  TUNNEL DIODES Tunnel diode circuit used as nanosecond-range time marker ARG-90164  Pressure-sensitive bonded junction transducers ERC-10087  TURBINE BLADES Nickel base alloy with improved starupture properties	B68-10095 es assurement B68-10109 or small- tungsten B68-10284 eperalloy B68-10369 ge B68-10030 B68-10173	03 03 05 03 01	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property chin aluminum alloys M-FS-20209  ULTRASONIC SOLDERING Inspection criteria ensure quality cof parallel gap soldering M-FS-14530  ULTRASONIC TESTS Evaluation of methods for nondestructesting of brazed joints ARG-90175  Automatic system nondestructively moand records fatigue crack growth LANGLEY-10091  Nondestructive testing of brazed rocengine components	B68-10244  B68-10516  B68-10279  anges  B68-10568  control  B68-10257  ctive  B68-10191  cnitors  B68-10379	01 03 03
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced nickel statewis-10424  TUNGSTEN CARBIDES Flare angles measured with ball gas M-FS-14690  TUNNEL DIODES Tunnel diode circuit used as nanosecond-range time marker ARG-90164  Pressure-sensitive bonded junction transducers ERC-10087  TURBINE BLADES Nickel base alloy with improved strupture properties LEWIS-10283	B68-10095 esseasurement B68-10109 or small- tungsten B68-10284 uperalloy B68-10369 ge B68-10030 B68-10173	03 03 05 03 01	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property chin aluminum alloys M-FS-20209  ULTRASONIC SOLDERING Inspection criteria ensure quality cof parallel gap soldering M-FS-14530  ULTRASONIC TESTS Evaluation of methods for nondestructesting of brazed joints ARG-90175  Automatic system nondestructively moand records fatigue crack growth LANGLEY-10091  Nondestructive testing of brazed rocengine components M-FS-18191  Stress-corrosion-induced property ch	B68-10244  B68-10516  B68-10279  anges  B68-10568  control  B68-10257  ctive  B68-10191  cnitors  B68-10379  sket  B68-10394	01 03 03 05
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced mickel statewis-10424  TUNGSTEN CARBIDES Flare angles measured with ball gas M-FS-14690  TUNNEL DIODES Tunnel diode circuit used as nanosecond-range time marker ARG-90164  Pressure-sensitive bonded junction transducers ERC-10087  TURBINE BLADES Nickel base alloy with improved strupture properties LEWIS-10283  TURBINE INSTRUMENTS High-pressure gas facilitates calib	B68-10095  as asurement B68-10109  or small-tungsten B68-10284  aperalloy B68-10369  ge B68-10030  B68-10173  B68-10563  ress  B68-10344  oration of	03 03 05 03 01	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property ch in aluminum alloys M-FS-20209  ULTRASONIC SOLDERING Inspection criteria ensure quality c of parallel gap soldering M-FS-14530  ULTRASONIC TESTS Evaluation of methods for nondestructesting of brazed joints ARG-90175  Automatic system nondestructively mo and records fatigue crack growth LANGLEY-10091  Nondestructive testing of brazed rocengine components M-FS-18191  Stress-corrosion-induced property ch in aluminum alloys	B68-10244  B68-10516  B68-10279  anges  B68-10568  control  B68-10257  ctive  B68-10191  cnitors  B68-10379  sket  B68-10394	01 03 03 05
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced mickel structure angles measured with ball gas M-FS-14690  TUNNEL DIODES Tunnel diode circuit used as nanosecond-range time marker ARG-90164  Pressure-sensitive bonded junction transducers ERC-10087  TURBINE BLADES Nickel base alloy with improved structure properties LEWIS-10283	B68-10095  as asurement B68-10109  or small-tungsten B68-10284  aperalloy B68-10369  ge B68-10030  B68-10173  B68-10563  ress  B68-10344  oration of	03 03 05 03 01	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property ch in aluminum alloys M-FS-20209  ULTRASONIC SOLDERING Inspection criteria ensure quality c of parallel gap soldering M-FS-14530  ULTRASONIC TESTS Evaluation of methods for nondestructesting of brazed joints ARG-90175  Automatic system nondestructively mo and records fatigue crack growth LANGLEY-10091  Nondestructive testing of brazed rocengine components M-FS-18191  Stress-corrosion-induced property ch in aluminum alloys	B68-10244  B68-10516  B68-10279  anges  B68-10568  control  B68-10257  ctive  B68-10191  cnitors  B68-10379  cket  B68-10394  anges	01 03 03 05 03
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced nickel statewis-10424  TUNGSTEN CARBIDES Flare angles measured with ball gas M-FS-14690  TUNNEL DIODES Tunnel diode circuit used as nanosecond-range time marker ARG-90164  Pressure-sensitive bonded junction transducers ERC-10087  TURBINE BLADES Nickel base alloy with improved strupture properties LEWIS-10283  TURBINE INSTRUMENTS High-pressure gas facilitates calit turbine flowmeters for liquid hyc	B68-10095 escasurement B68-10109 er small- tungsten B68-10284 escalloy B68-10369 ge B68-10030 B68-10173 B68-10563 ress B68-10344 eration of	03 03 05 03 01 01	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property chin aluminum alloys M-FS-20209  ULTRASONIC SOLDERING Inspection criteria ensure quality cof parallel gap soldering M-FS-14530  ULTRASONIC TESTS Evaluation of methods for nondestructesting of brazed joints ARG-90175  Automatic system nondestructively moand records fatigue crack growth LANGLEY-10091  Nondestructive testing of brazed rocengine components M-FS-18191  Stress-corrosion-induced property chin aluminum alloys M-FS-20209	B68-10244  B68-10516  B68-10279  anges  B68-10568  control  B68-10257  ctive  B68-10257  ctive  B68-10394  anges  B68-10568	01 03 03 05 03
TUNGSTEN ALLOYS Cobalt-tungsten, ferromagnetic high-temperature alloy LEWIS-10378  Tungsten-rhenium alloy thermocouple effective for high-temperature me ARG-10059  Fabrication techniques developed for diameter, thin-wall tungsten and alloy tubing ARG-10100  Tungsten fiber-reinforced mickel statewis-10424  TUNGSTEN CARBIDES Flare angles measured with ball gas M-FS-14690  TUNNEL DIODES Tunnel diode circuit used as nanosecond-range time marker ARG-90164  Pressure-sensitive bonded junction transducers ERC-10087  TURBINE BLADES Nickel base alloy with improved starupture properties LEWIS-10283  TURBINE INSTRUMENTS High-pressure gas facilitates calib turbine flowmeters for liquid hydroxides.	B68-10095  assurement B68-10109  or small- tungsten B68-10284  uperalloy B68-10369  B68-10369  B68-10173  B68-10563  ress B68-10344  oration of irogen B68-10145	03 03 05 03 01 01	Improved traveling wave maser amplif NPD-10548  ULTRAHIGH VACUUM High-temperature thermionic emission microscope NPD-10584  ULTRASONIC RADIATION One hundred angstrom niobium wire LEWIS-10128  Stress-corrosion-induced property chin aluminum alloys M-FS-20209  ULTRASONIC SOLDERING Inspection criteria ensure quality cof parallel gap soldering M-FS-14530  ULTRASONIC TESTS Evaluation of methods for nondestructesting of brazed joints ARG-90175  Automatic system nondestructively moand records fatigue crack growth LANGLEY-10091  Nondestructive testing of brazed rocengine components M-FS-18191  Stress-corrosion-induced property chin aluminum alloys M-FS-20209  ULTRASONICS Development of mechanized ultrasonic scanning system	B68-10244  B68-10516  B68-10279  anges  B68-10568  control  B68-10257  ctive  B68-10257  ctive  B68-10394  anges  B68-10568	01 03 03 05 03

inspection system ARG-90237	B68-10088	01	MSC-15108	B68-10362	01
Ultrasonic temperature measuring d	evice	01	VACUUM APPARATUS Vacuum-jacketed transfer line instal technique	llation	
	-		M-FS-14496	B68-10125	05
Stress-corrosion-induced property in aluminum alloys		0.77	Vacuum probe sampler removes micron-	-sized	
M-FS-20209	B68-10568	03	particles from surfaces SAN-10003	B68-10231	04
ULTRAVIOLET PHOTOMETRY UV detector monitors organic conta	mination		Conceptual dead weight device to pro	ovide	
of optical surfaces M-FS-20246	B68-10413	01	pressure calibration M-FS-14672	B68-10264	01
ULTRAVIOLET RADIATION Fluorescent particles enable visua	lization		VACUUM CHAMBERS Application of the solid lubricant		
of gas flow M-FS-14583	B68-10259	20	molybdenum disulfide by sputtering LEWIS-10544	g B68-10340	03
		02		DCC 10040	00
High-voltage pulse generator devel wide-gap spark chambers	oped for		Miniaturized King furnace permits absorption spectroscopy of small s		
ARG-10136	B68-10283	01	ARG-10177	B68-10418	02
Coolants with selective optical fi characteristics for ruby laser a			High-temperature thermionic emission microscope	n	
M-FS-20188	B68-10508	20	NPO-10584	B68-10516	01
ULTRAVIOLET SPECTROSCOPY			VACUUM DEPOSITION		
The preparation, identification an properties of chlorophyll deriva			Graphite cloth facilitates vacuum evaporation of silicon monoxide		
ARG-10205	B68-10409	03	M-FS-14764	B68-10256	03
UNDERWATER VEHICLES			Preparation of silver-activated zinc	c sulfide	
Ballast barge concept for underwat structures	er		thin films GSFC-10687	B68-10271	03
KSC-10196	868-10168	05	Superconductive thin film makes con-	venient	
UNIONS (CONNECTORS)			liquid helium level sensor		
Hand-tightened, high-pressure seal M-FS-18416	B68-10417	05	LANGLEY-10289	B68-10341	01
Tube joint leak repair coupling			VACUUM FURNACES Antechamber facilitates loading and		
MSC-15022	B68-10540	05	unloading of vacuum furnace	B68-10135	02
UNMANNED SPACECRAFT			LEWIS-10265	B00-10133	02
Feasibility study of wireless powe transmission systems	r		Miniaturized King furnace permits absorption spectroscopy of small:	samples	
M-FS-14691	B68-10309	01	ARG-10177	B68-10418	02
URANIUM			VACUUM GAGES		
Ignition of binary alloys of urani ARG-10057	B68-10280	01	Absolute low-pressure calibration s M-FS-13085	B68-10160	20
URANIUM ALLOYS			VACUUM PUMPS		
Ignition of binary alloys of urani ARG-10057	um B68-10280	01	Reliable method for testing gross lesemiconductor component packages	eaks in	
			ERC-10150	B68-10562	01
URANIUM COMPOUNDS Study of mechanical properties of	uranium		VACUUM SYSTEMS		
compounds ARG-10074	B68-10197	03	Precise doping of metals by small g LEWIS-10444	B68-10526	03
URANIUM OXIDES			VALUE		
Characteristics of fluidized-packet	ed beds B68-10278	03	Properties of optics at high temper their measurement, a study	ature and	
ARG-10049	800-10276		M-FS-14696	B68-10240	02
UTILIZATION  Computer program conducts faciliti	ies		VALVES		4
utilization and occupancy survey NPO-10438	B68-10137	06	Pressure variable orifice for hydra control valve	ulic	
V			MSC-11323	B68-10120	05
* .		,	Dynamically stable check valve conc	ept for	
VACANCIES (CRYSTAL DEFECTS)  Reaction rates of graphite with oz	zone		wide flow range M-FS-14579	B68-10247	05
measured by etch decoration ARG-10086	B68-10101	03	High-torque power wrench, a concept		
VACUUM			M-FS-18194	B68-10299	05
Isotopically pure magnesium isotop			Fluidic-thermochromic display devic	e B68-10350	01
prepared from magnesium-24 oxide ARG-10154	B68-10293	02	ERC-10031		31
Food products for space application	ons		Evaluation of a fluorocarbon plasti in cryogenic valve seals	c used	
MSC-11697	B68-10324	04	M-FS-18189	B68-10523	03
Rating of electrical wires in vacue environments	uum		VAN DER WAAL FORCES Study of behavior of sterols at int	erfaces	

			VIDICONS Color-televised medical microscopy	
A mass flux probe for measurement i supersonic stream LEWIS-10695	in a B68-10533	0.2	Selective video blanking technique M-FS-20013 B68-10434	01
VELOCITY MEASUREMENT Laser Doppler gas-velocity instrum M-FS-20039	ent B68-10349	02	Solid state high-voltage pulser operates with low supply voltage M-FS-14034 B68-10308	01
Design of fluid-duct bends with low pressure loss M-FS-20176	B68-10395	05	Facsimile video enhancement device GSFC-10185 B68-10207	01
Dynamics of moving bubbles in sing binary component systems M-FS-14845	B68-10339	02	VIDEO EQUIPMENT  System remotely inspects, measures, and records internal irregularities in piping M-FS-14545  B68-10149	01
accelerating container MSC-11560	B68-10170	02	dynamic loading M-FS-14980 B68-10515	05
LEWIS-10252  Large-amplitude inviscid fluid moti	B68-10097	06	M-FS-18191 B68-10394  Fatigue of reinforced concrete beams under	03
VELOCITY DISTRIBUTION  Computer program calculates velocity streamlines in turbomachines		0.5	VIBRATIONAL STRESS  Nondestructive testing of brazed rocket engine components	Δ.77
Internal velocity factors MSC-15002	B68-10403	06	structure M-FS-14972 B68-10353	05
MSC-11774	B68-10374	06	Shock and vibration response of multistage	
Axisymmetric two-phase perfect gas performance program			Vibration testing and dynamic studies of relays M-FS-14542 B68-10268	01
Study of optimum discrete estimator measurement analysis M-FS-14915	s in B68-10348	02	LANGLEY-89 B68-10124 VIBRATION TESTS	01
Computer program analyzes and design supersonic wing-body combinations ARC-10141		06	VIBRATION MEASUREMENT Reliable, self-calibrating vibration transducer	
GSFC~10305 VELOCITY	B68-10315	01	Improved active vibration isolator LANGLEY-10106 B68-10123	05
M-FS-14915  VECTORS (MATHEMATICS)  Gimbal angle sensor	DOG-10348	uz.	VIBRATION ISOLATORS Sleeved damper limits spring surging MSC-12071 B68-10111	05
VECTOR ANALYSIS  Study of optimum discrete estimator measurement analysis M-FS-14015	s in B68-10348	20	Mass loading effects on vibrated ring and shell structures M-FS-14979 B68-10532	03
Dispensing graduate for butadiene NPO-10070	B68-10524	03	Between-bearing shaft seal, a concept M-FS-18179 B68-10286	05
prepared from magnesium-24 oxide ARG-10154	B68-10293	02	handling shock and vibration M-FS-13007 B68-10219	05
Isotopically pure magnesium isotope		VO	VIBRATION Packaging criteria for transportation and	
VAPORIZING Viscosity and density of methanol/w mixtures at low temperatures M-FS-14991	ater B68-10274	03	VERTICAL MOTION Remotely operated gripper provides vertical control rod movement ARG-10160 B68-10359	05
VAPOR PRESSURE Quasi-static vapor pressure measure on reactive systems in inert atmo ARG-90142		01	VERSATILITY Versatile impact hand tool M-FS-20140 B68-10371	05
VAPOR PHASES Dispensing graduate for butadiene NPO-10070	B68-10524	03	VENTURI TUBES Venturi meter with separable diffuser LEWIS-10483 B68-10295	05
VAPOR DEPOSITION An investigation of particle mixing gas-fluidized bed ARG-10182	in a B68-10407	05	Device damps fluid pressure oscillations in vent valve M-FS-13290 B68-10078	05
VANADIUM ALLOYS Consolidation and fabrication techn for vanadium-20 w/o titanium /TV- ARG-10148		03	VENTS  Vent and relief valve maintains low leakage rate over broad temperature range M-FS-12807  B68-10014	05
Consolidation and fabrication techn for vanadium-20 w/o titanium /TV- ARG-10148		03	Battery-package design provides for cell cooling and constraint MSC-11839 B68-10398	05
ARG-10085 Vanadium	B68-10281	03	VENTING Two-fluid, impinging-sheet injector NPO-10547 B68-10338	05

VISCOMETERS SUBJECT INDEX

MSC-13086	B68-10314	01	Improved limiter for turn-on curren	nt .	
VISCOMETERȘ			transient GSFC-10413	B68-10384	01
Viscosity and density of methanol/ mixtures at low temperatures M-FS-14991	water B68-10274	03	High-efficiency step-up regulator M-FS-20049	B68-10432	01
VISCOSITY Viscosity and density of methanol/	water		VOLTMETERS Recharge unit provides for optimum		
mixtures at low temperatures M-FS-14991	B68-10274	03	recharging of battery cells GSFC-10688	B68-10273	01
Real fluid properties of normal and	d		System measures arc energy dissipat	ed in	
parahydrogen LEWIS-10458	B68-10361	06	relay contact cycling M-FS-14541	B68-10312	01
VISCOUS DAMPING			VULCANIZED ELASTOMERS		
Viscous damper MSC-12072	B68-10110	05	Compressible sleeve provides automa centering for grinding or turning cylinders		
VISIBILITY	·		SAN-10021	B68-10318	05
Thermal protective visor for enter high temperature areas	-		VULCANIZING		
MSC-10285 VISORS	B68-10277	05	Encapsulation technique eliminates stresses in welded electronic mod M-FS-14581	thermal iules B68-10307	01
Thermal protective visor for enter	ing		• • •	222 2323.	
high temperature areas MSC-10285	B68-10277	05	W		
VISUAL OBSERVATION			WAKES Acoustic wave analysis		
Automatic patient respiration fail detection system with wireless t			M-FS-18076	B68-10265	02
ARC-10174	B68-10365	01	WARNING SYSTEMS Silicon solar cell monitors high to	amaaatuna	
VISUAL SIGNALS			furnace operation	=	
Conceptual apparatus for detecting nonconductive liquids	leaks of		NUC-10163	B68-10148	01
M-FS-14713	B68-10303	01	Automatic patient respiration failu detection system with wireless to	ransmission	
Automatic patient respiration fail detection system with wireless t			ARC-10174	B68-10365	01
ARC-10174	B68-10365	01	WARPAGE Asbestos and Inconel combined to fo	orm hot-das	•
VOICE COMMUNICATION			seal	_	
Electrocardiograph transmitted by telephone links in emergency sit FRC-10031		01	M-FS-14004 WASTE UTILIZATION	B68-10162	05
VOLATILITY	-		Electrolytic silver ion cell steri water supply		
Technological survey of tellurium compounds	and its		MSC-11827	B68-10555	01
ARG-10119	B68-10201	03	WATER Viscosity and density of methanol/	uaton	
Characteristics of fluidized-packe			mixtures at low temperatures		
ARG-10049	B68-10278	03	M-FS-14991	B68-10274	03
Dispensing graduate for butadiene NPO-10070	B68-10524	03	WATER MODERATED REACTORS  Portable, high intensity isotopic of the source provides increased experience.		
VOLTAGE AMPLIFIERS			accuracy		
Improved dc voltage multiplier M-FS-14042	B68-10074	01	ARG-90250	B68-10243	02
VOLTAGE GENERATORS			WATER TREATMENT  Effects of surface preparation on (	quality	
Superconducting switch permits mea			of aluminum alloy weldments	B68-10302	্≱ 03
of small voltages at cryogenic t ARG-90260	emperatures B68-10087	01	M-FS-13152	P00-10305	U S
System measures response time of			Electrolytic silver ion cell steri: water supply	lizes	
photomultiplier tubes			MSC-11827	B68-10555	01
LEWIS-10437	B68-10382	01	WATER VAPOR		
VOLTAGE REGULATORS  Circuit detects voltage decrease i	n ·		Welding of commercial base plates investigated	is	
computer power supply			M-FS-13649	B68-10192	03
KSC-67-120	B68-10019	01	Plume radiation program		
Deep space FM system, a concept MSC-11825	B68-10289	01	M-FS-13202	B68-10447	06
Current-limiting voltage regulator			High conductance vapor thermal swi GSFC-10109	tch . B68-10519	02
MSC-11824	B68-10305	01	Reliable method for testing gross	leaks in	
Analysis and design of a class-D a M-FS-14803	mplifier B68-10313	01	semiconductor component packages ERC-10150	B68-10562	01
Concept to convert electrical powe GSFC-10222	B68-10321	01	WAVE ATTENUATION Stress-corrosion-induced property	changes	

in aluminum alloys M-FS-20209	B68-10568	03	Automatic, nondestructive test monitors in-process weld quality	0.1
			M-FS-14996 B68-10333	01
WAVE EQUATIONS Acoustic wave analysis M-FS-18076	B68-10265	02	WELD TESTS Gage monitors quality of cross-wire	
Calution of differential counting	. h	1	resistance welds GSFC-90549 B68-10002	01
Solution of differential equations application of transformation gr M-FS-14802		02	Development of mechanized ultrasonic	UI
			scanning system	
WAVE EXCITATION Vibration testing and dynamic stud	lies of		M-FS-13638 B68-10004	0.5
relays M-FS-14542	B68-10268	01	System remotely inspects, measures, and records internal irregularities in piping	
WAVE INTERACTION		<b>V1</b>	M-FS-14545 B68-10149	01
One-dimensional coulomb-damped way	e motion		Welding of commercial base plates is	
in prismatic bars M-FS-14815	B68-10548	02	investigated M-FS-13649 B68-10192	03
WAVEFORMS			Automatic, nondestructive test monitors	
Dynamic linearity measurement tech KSC-10186	nnique B68-10290	01	in-process weld quality M-FS-14996 B68-10333	01
Nondestructive test determines over destruction characteristics of a limiter fuses			Microprobe investigation of brittle segregates in aluminum MIG and TIG welds M-FS-14720 B68-10334	03
XGS-08566	B68-10364	01	11 13 141 100 1	•••
			X-ray film holder permits single	
Operational integrator			continuous picture of tubing joint	
NPO-10230	B68-10547	01	LEWIS-10382 B68-10343	05
₩AVEGUIDES			WELDABILITY	
Improved traveling wave maser amp			Weld microfissuring in Inconel 718	
NPO-10548	B68-10244	01	minimized by minor elements	
WAVELENGTHS			M-FS-18185 B68-10251	03
Electro-optic modulator for infra	red laser		High temperature alloy	
using gallium arsenide crystal			LEWIS-10377 B68-10253	03
GSFC-10686	B68-10255	02	UELDED LOTHER	
Feasibility study of wireless power	ə <b>r</b>		WELDED JOINTS Tube dimpling tool assures accurate	
transmission systems	•		dip-brazed joints	
M-FS-14691	B68-10309	01	MSC-533 B68-10036	05
WAVES			Standards for compatibility of printed	
Improved gas ring laser MSC-11584	B68-10304	02	circuit and component lead materials M-FS-14531 B68-10310	01
Improved gas ring laser MSC-11584		02	circuit and component lead materials M-FS-14531 B68-10310	01
Improved gas ring laser MSC-11584 One-dimensional coulomb-damped wa		02	circuit and component lead materials M-FS-14531 B68-10310 Closed circuit TV system automatically	01
Improved gas ring laser MSC-11584		02 02	circuit and component lead materials M-FS-14531 B68-10310	01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped wave in prismatic bars M-FS-14815	ve motion		circuit and component lead materials M-FS-14531 B68-10310  Closed circuit TV system automatically guides welding arc M-FS-20084 B68-10357	
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped was in prismatic bars M-FS-14815  WEAR	we motion B68-10548		circuit and component lead materials M-FS-14531 B68-10310  Closed circuit TV system automatically guides welding arc M-FS-20084 B68-10357  Cooled miniature pressure transducers	
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped was in prismatic bars M-FS-14815  WEAR Spiral-grooved shaft seals substanted the seals sub	we motion B68-10548	02	circuit and component lead materials M-FS-14531 B68-10310  Closed circuit TV system automatically guides welding arc M-FS-20084 B68-10357	
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped was in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substa	we motion B68-10548		circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  B68-10370	01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped was in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substanted to the seal of the	we motion B68-10548	02	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket	01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped way in prismatic bars M-FS-14815  WEAR Spiral-grooved shaft seals substant reduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubrican	me motion  B68-10548  Intially  B68-10270	02	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  B68-10370	01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped was in prismatic bars M-FS-14815  WEAR Spiral-grooved shaft seals substanted the seals sub	me motion  B68-10548  Intially  B68-10270	02	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  B68-10394	01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped way in prismatic bars M-FS-14815  WEAR Spiral-grooved shaft seals substanted leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricanted leakage leakage and lewis-10408	we motion B68-10548 ntially B68-10270	02 05	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  B68-10370  Nondestructive testing of brazed rocket engine components M-FS-18191  B68-10394  WELDED STRUCTURES	01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped way in prismatic bars M-FS-14815  WEAR Spiral-grooved shaft seals substant reduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubrican	me motion  B68-10548  Initially  B68-10270	02 05	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  B68-10394	01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped way in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substanted reduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricant LEWIS-10408  WEATHERING  Simulated hailstone fabrication antesting weatherability of struct	me motion  B68-10548  Initially  B68-10270  Its  B68-10249  Ind use in tures	02 05 05	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  WELDED STRUCTURES Plastic preforms facilitate fabrication	01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped was in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substanted to leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricantewis-10408  WEATHERING Simulated hallstone fabrication as	me motion  B68-10548  Initially  B68-10270  Its  B68-10249  Ind use in	02 05	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  B68-10394  WELDED STRUCTURES Plastic preforms facilitate fabrication of welded cordwood electronic modules LEWIS-90339  B68-10063	01 01 03
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped way in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substanted reduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricant LEWIS-10408  WEATHERING  Simulated hailstone fabrication antesting weatherability of struct	me motion  B68-10548  Initially  B68-10270  Its  B68-10249  Ind use in tures	02 05 05	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  WELDED STRUCTURES Plastic preforms facilitate fabrication of welded cordwood electronic modules	01 01 03
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped way in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substanteduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricantewis-10408  WEATHERING Simulated hailstone fabrication and testing weatherability of structure in the structure of the structure in the	me motion  B68-10548  Initially  B68-10270  Its  B68-10249  Ind use in tures	02 05 05	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  WELDED STRUCTURES Plastic preforms facilitate fabrication of welded cordwood electronic modules LEWIS-90339  B68-10063  Encapsulation technique eliminates thermal	01 01 03
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped was in prismatic bars M-FS-14815  WEAR Spiral-grooved shaft seals substant reduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricant LEWIS-10408  WEATHERING Simulated hailstone fabrication and testing weatherability of struction NPO-10783  WEIGHTING FUNCTIONS Procedure developed for reporting fast-neutron exposure	me motion  B68-10548  Initially  B68-10270  Its  B68-10249  Ind use in tures  B68-10552	02 05 05	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  WELDED STRUCTURES Plastic preforms facilitate fabrication of welded cordwood electronic modules LEWIS-90339  Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  B68-10307	01 01 03
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped way in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substanteduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricantewis-10408  WEATHERING Simulated hailstone fabrication and testing weatherability of structure in the structure of the structure in the	me motion  B68-10548  Initially  B68-10270  Its  B68-10249  Ind use in tures	02 05 05	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  WELDED STRUCTURES Plastic preforms facilitate fabrication of welded cordwood electronic modules LEWIS-90339  Encapsulation technique eliminates thermal stresses in welded electronic modules	01 01 03
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped way in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substant seduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricant LEWIS-10408  WEATHERING Simulated hallstone fabrication and testing weatherability of structing NPO-10783  WEIGHTING FUNCTIONS Procedure developed for reporting fast-neutron exposure ARG-10035	me motion  B68-10548  Initially  B68-10270  Its  B68-10249  Ind use in tures  B68-10552  B68-10190	02 05 05	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  WELDED STRUCTURES Plastic preforms facilitate fabrication of welded cordwood electronic modules LEWIS-90339  Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  WELDING Mechanical shielding reduces weld surface cracking in 6061 T6 aluminum	01 01 03 01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped way in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substant reduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricant LEWIS-10408  WEATHERING Simulated hailstone fabrication ant testing weatherability of struct NPO-10783  WEIGHTING FUNCTIONS Procedure developed for reporting fast-neutron exposure ARG-10035  WEIGHTLESSNESS Food products for space application	me motion  B68-10548  Initially  B68-10270  Its  B68-10249  Ind use in tures  B68-10552  B68-10190  Ons	02 05 05 03	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  WELDED STRUCTURES Plastic preforms facilitate fabrication of welded cordwood electronic modules LEWIS-90339  Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  WELDING Mechanical shielding reduces weld surface	01 01 03 01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped way in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substant seduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricant LEWIS-10408  WEATHERING Simulated hailstone fabrication and testing weatherability of structing NPO-10783  WEIGHTING FUNCTIONS Procedure developed for reporting fast-neutron exposure ARG-10035	me motion  B68-10548  Initially  B68-10270  Its  B68-10249  Ind use in tures  B68-10552  B68-10190	02 05 05	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  WELDED STRUCTURES Plastic preforms facilitate fabrication of welded cordwood electronic modules LEWIS-90339  Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  WELDING Mechanical shielding reduces weld surface cracking in 6061 T6 aluminum	01 01 03 01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped way in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substant reduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricant LEWIS-10408  WEATHERING Simulated hailstone fabrication and testing weatherability of struct NPO-10783  WEIGHTING FUNCTIONS Procedure developed for reporting fast-neutron exposure ARG-10035  WEIGHTLESSNESS Food products for space application MSC-11697  WELD STRENGTH	me motion  B68-10548  Initially  B68-10270  Its  B68-10249  Ind use in tures  B68-10552  B68-10190  Ons	02 05 05 03	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  WELDED STRUCTURES Plastic preforms facilitate fabrication of welded cordwood electronic modules LEWIS-90339  B68-10063  Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  WELDING Mechanical shielding reduces weld surface cracking in 6061 T6 aluminum MSC-11494  B68-10022  Automatic contour welder incorporates speed control system	01 01 03 01 01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped was in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substant reduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricant LEWIS-10408  WEATHERING Simulated hailstone fabrication as testing weatherability of struct NPO-10783  WEIGHTING FUNCTIONS Procedure developed for reporting fast-neutron exposure ARG-10035  WEIGHTLESSNESS Food products for space application MSC-11697  WELD STRENGTH Welder analyzer	me motion  B68-10548  Initially  B68-10270  Its  B68-10249  Ind use in tures  B68-10552  B68-10190  Indian before the mean of	02 05 05 03 02	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  WELDED STRUCTURES Plastic preforms facilitate fabrication of welded cordwood electronic modules LEWIS-90339  Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  WELDING Mechanical shielding reduces weld surface cracking in 6061 T6 aluminum MSC-11494  B68-10022  Automatic contour welder incorporates	01 01 03 01 01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped way in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substant reduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricant LEWIS-10408  WEATHERING Simulated hailstone fabrication and testing weatherability of struct NPO-10783  WEIGHTING FUNCTIONS Procedure developed for reporting fast-neutron exposure ARG-10035  WEIGHTLESSNESS Food products for space application MSC-11697  WELD STRENGTH	me motion  B68-10548  Initially  B68-10270  Its  B68-10249  Ind use in tures  B68-10552  B68-10190  Ons	02 05 05 03	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  WELDED STRUCTURES Plastic preforms facilitate fabrication of welded cordwood electronic modules LEWIS-90339  Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  WELDING Mechanical shielding reduces weld surface cracking in 6061 T6 aluminum MSC-11494  Automatic contour welder incorporates speed control system M-FS-14574  B68-10091	01 01 03 01 01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped was in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substance leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricance Lewis-10408  WEATHERING Simulated hailstone fabrication and testing weatherability of structor NPO-10783  WEIGHTING FUNCTIONS Procedure developed for reporting fast-neutron exposure ARG-10035  WEIGHTLESSNESS Food products for space application MSC-11697  WELD STRENGTH Welder analyzer MSC-12068  Pre-weld heat treatment improves	motion  B68-10548  Initially  B68-10270  Its  B68-10249  Ind use in tures  B68-10552  B68-10552	02 05 05 03 02	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  WELDED STRUCTURES Plastic preforms facilitate fabrication of welded cordwood electronic modules LEWIS-90339  Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  WELDING Mechanical shielding reduces weld surface cracking in 6061 T6 aluminum MSC-11494  Automatic contour welder incorporates speed control system M-FS-14574  B68-10091  Proposed gas generation assembly would recover deeply submerged objects	01 01 03 01 01
Improved gas ring laser MSC-11584  One-dimensional coulomb-damped way in prismatic bars M-FS-14815  WEAR  Spiral-grooved shaft seals substant reduce leakage and wear LEWIS-10397  WEAR INHIBITORS High-temperature bearing lubricant LEWIS-10408  WEATHERING Simulated hailstone fabrication and testing weatherability of struct NPO-10783  WEIGHTING FUNCTIONS Procedure developed for reporting fast-neutron exposure ARG-10035  WEIGHTLESSNESS Food products for space application MSC-11697  WELD STRENGTH Welder analyzer MSC-12068  Pre-weld heat treatment improves and the structure of the st	me motion  B68-10548  Intially  B68-10270  Its  B68-10249  Ind use in tures  B68-10552  B68-10190  Indian B68-10324  B68-10324  B68-10324  B68-10242	02 05 05 03 02 04	circuit and component lead materials M-FS-14531  Closed circuit TV system automatically guides welding arc M-FS-20084  B68-10357  Cooled miniature pressure transducers effective at high temperatures LEWIS-10401  Nondestructive testing of brazed rocket engine components M-FS-18191  WELDED STRUCTURES Plastic preforms facilitate fabrication of welded cordwood electronic modules LEWIS-90339  B68-10063  Encapsulation technique eliminates thermal stresses in welded electronic modules M-FS-14581  WELDING Mechanical shielding reduces weld surface cracking in 6061 T6 aluminum MSC-11494  B68-10022  Automatic contour welder incorporates speed control system M-FS-14574  B68-10091  Proposed gas generation assembly would	01 01 03 01 01
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	of aluminum alloy weldments	neo 10700'	0.7	WING PROFILES		
	M-FS-13152	B68-10302	03	Computer program analyzes and design supersonic wing-body combinations		
5	Standards for compatibility of pri circuit, and component lead mater			ARC-10141	B68-10335	06
	M-FS-14531	B68-10310	01	WIRE		
f	Automatic, nondestructive test mon in-process weld quality	itors		Multilayer plated wire shows promismemory device MSC-11587	se as B68-10205	01
	M-FS-14996	B68-10333	01	100 1100	000 10200	0.1
C	Compact monitoring and control con	sole for		One hundred angstrom niobium wire LEWIS-10128	B68-10279	03
	pressurized gas bottles M-FS-14874	B68-10401	05	Dual wire weld feed proportioner M-FS-18037	B68-10332	05
١	Weld preparation tool for pipes an KSC-09955	d tubing B68-10551	05	Rating of electrical wires in vacu		
	DING MACHINES Improved torch increases weld qual	ity in		MSC-15108	B68-10362	01
	refractory metals	200 10041	0.5	Method for making small pointed		
	LEWIS-324	B68-10041	05	thermocouples SAN-10014	B68-10389	01
ı	Velder analyzer MSC-12068	B68-10242	01	WIRELESS COMMUNICATIONS		
P	iniature pressure transducer for member application	stressed		Feasibility study of wireless power transmission systems M-FS-14691	r B68-10309	01
	MSC-11869	B68-10246	01		200 2000	
9	Standards for compatibility of pri	nted		WIRING Multichannel wireway adapter box		
	circuit and component lead mater	ials		MSC-90645	B68-10052	05
	M-FS-14531	B68-10310	01	WRENCHES		
(	Closed circuit TV system automatic	ally		Magnetically controlled torque wrea	nch	
	guides welding arc M-FS-20084	B68-10357	01	prevents overtorquing SAN-10002	B68-10209	05
		200 2000				
WHE	SLS Shock—absorbing caster wheel is si compact	mple and		High-torque power wrench, a concep M-FS-18194	B68-10299	05
	SAN-10019	B68-10266	05	Χ		
WING	CHES			X RAY ASTRONOMY		
ŀ	loisting frame facilitates handlin	g of large		Imaging slitless spectrometer for	X-ray	
	objects M-FS-16166	B68-10575	05	astronomy M-FS-14309	B68-10546	02
WINI	D EFFECTS			X RAY INSPECTION		
	Suspended chains damp wind-induced			X-ray film holder permits single		
	oscillations of tall flexible st					
	LANGLEY-10193	ructures B68-10042	05	continuous picture of tubing join LEWIS-10382	nt B68-10343	05
	LANGLEY-10193  D MEASUREMENT	B68-10042	05	LEWIS-10382 X RAY SPECTROSCOPY	B68-10343	05
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	LANGLEY-10193 D MEASUREMENT Fast-response cup anemometer featu	B68-10042	05	LEWIS-10382  X RAY SPECTROSCOPY  Imaging slitless spectrometer for 1	B68-10343	05
MINI	LANGLEY-10193  D MEASUREMENT Fast-response cup anemometer featu cosine response ARG-90193  D TUNNELS	B68-10042 res B68-10202		LEWIS-10382  X RAY SPECTROSCOPY Imaging slitless spectrometer for astronomy M-FS-14309  X RAY TELESCOPES	B68-10343 X-ray B68-10546	
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AING (AING)	LANGLEY-10193  DEMEASUREMENT Fast-response cup anemometer feature cosine response ARG-90193  DEMEASUREMENT To trunkels Laser Doppler gas-velocity instrum M-FS-20039  DEMEASUREMENT Independent doubly truncated gamma M-FS-20143  DOWS (APERTURES) Detection of effect of deposits on windows of pyrometer measurement LEWIS-10366  GEAMBER Computer program analyzes and desi supersonic wing-body combination ARC-10141  Modified Multhopp mean camber comp program LANGLEY-10376  GEPANELS Computer program analyzes and desi supersonic wing-body combination ARC-10141	B68-10042  res  B68-10202  ent B68-10349  variables B68-10345  optical S B68-10367  gns S B68-10335  uter B68-10446	01 02 02 01 06	X RAY SPECTROSCOPY Imaging slitless spectrometer for astronomy M-FS-14309  X RAY TELESCOPES Imaging slitless spectrometer for astronomy M-FS-14309  X RAYS Weld microfissuring in Inconel 718 minimized by minor elements M-FS-18185  Rotary-knife stripper facilitates of X-ray film from pack M-FS-14837  X-Y PLOTTERS System remotely inspects, measures records internal irregularities M-FS-14545  XENON COMPOUNDS Metabolic and toxicological effect water-soluble xenon compounds are ARG-90239  XEROGRAPHY Shortened procedure for obtaining reproducible copies of 35 mm columns.	B68-10343  X-ray B68-10546  X-ray B68-10546  B68-10251  removal B68-10509  , and in piping B68-10149  s of e studied B68-10076  or slides	02 02 03* 05
AING ()	LANGLEY-10193  D MEASUREMENT Fast-response cup anemometer feature cosine response ARG-90193  D TUNNELS Laser Doppler gas-velocity instrum M-FS-20039  D VELOCITY MEASUREMENT Independent doubly truncated gamma M-FS-20143  DOWS (APERTURES) Detection of effect of deposits on windows of pyrometer measurement LEWIS-10366  G CAMBER Computer program analyzes and desi supersonic wing-body combination ARC-10141  Modified Multhopp mean camber comp program LANGLEY-10376  G PANELS Computer program analyzes and desi supersonic wing-body combination and complete program analyzes and desi supersonic wing-body combination computer program analyzes and desi supersonic wing-body combination supersonic wing-body supersoni	B68-10042  res  B68-10202  ent B68-10349  variables B68-10345  optical S B68-10367  gns S B68-10335  uter B68-10446  gns S B68-10335	01 02 02 01 06	LEWIS-10382  X RAY SPECTROSCOPY Imaging slitless spectrometer for astronomy M-FS-14309  X RAY TELESCOPES Imaging slitless spectrometer for astronomy M-FS-14309  X RAYS  Weld microfissuring in Inconel 718 minimized by minor elements M-FS-18185  Rotary-knife stripper facilitates of X-ray film from pack M-FS-14837  X-Y PLOTTERS System remotely inspects, measures records internal irregularities M-FS-14545  XENON COMPOUNDS Metabolic and toxicological effect: water-soluble xenon compounds are ARG-90239  XEROGRAPHY Shortened procedure for obtaining	B68-10343  X-ray B68-10546  X-ray B68-10546  B68-10251  removal B68-10509  , and in piping B68-10149  s of e studied B68-10076	02 02 03° 05

Y

YIELD STRENGTH Improved thermal treatment of aluminum	
alloy 7075 M-FS-20083 B68-10534	05
Weld joint strength and mechanical properties in 2219-T81 aluminum alloy	
LEWIS-10479 B68-10561	03
YTTRIUM-IRON GARNET Improved traveling wave maser amplifier NPO-10548 B68-10244	01
<sub>avve</sub> Z	
ZINC  Zinc-oxygen primary cell yields high  energy density	
M-FS-14661 B68-10218	01
ZINC ALLOYS  Resistivity measurements of  neutron-irradiated pure metals and Al-Zn alloys	
ARG-10108 B68-10200	03
ZINC SULFIDES Preparation of silver-activated zinc sulfide thin films	
GSFC-10687 B68-10271	03
ZIRCONIUM Studies in zirconium oxidation ARG-10099 B68-10199	03
High-speed camera synchronization M-FS-18062 B68-10282	02
Nickel-base superalloy*s excellent properties promote its service to 2200 degrees F	
LEWIS-10355 B68-10380	03
High-emittance coatings on metal substrates LEWIS-10325 B68-10381	03
ZIRCONIUM OXIDES Reinforced thermal-shock resistant ceramics LEWIS-10376 B68-10085	03

Issue 8

### Originator/Tech Brief Number Index

The left hand column identifies the originator number; to the right of each originator number is the Tech Brief number, e.g., B68-10023, followed by a two-digit number, e.g., 01, which identifies the subject category containing the entire citation.

ARC-10042		B68-10539	01
ARC-10060	*******	B68-10175	01
ARC-10083		B68-10065	01
ARC-10098		B68-10358	03
ARC-10130		B68-10164	06
ARC-10141		B68-10335	06
ARC-10146		B68-10210	01
ARC-10168		B68-10453	06
ARC-10174		B68-10365	01
ARG-10027		B68-10372	05
ARG-10035	*********	B68-10190	02
ARG-10049		B68-10278	03
ARG-10051		B68-10189	63
ARG-10057		B68-10280	01
ARG-10059		B68-10109	03
ARG-10062		B68-10195	03
ARG-10064		B68-10169	04
ARG-10065	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	B68-10425	03
ARG-10067		B68-10196	03
ARG-10074		B68-10197	03
ARG-10075		B68-10103	03
ARG-10085	**********	B68-10281	03
ARG-10086		B68-10101	03
ARG-10087		B68-10102	03
ARG-10092		B68-10198	03
ARG-10094		B68-10174	02
ARG-10099		B68-10199	03
ARG-10100	••••••••	B68-10284	05
ARG-10101		B68-10326	02
ARG-10102		B68-10181	02
ARG-10108		B68-10200	03
ARG-10109		B68-10077	02
ARG-10110	******************	B68-10328	01
ARG-10114	,	B68-10083	01
ARG-10115		B68-10194	03
ARG-10119	••••	B68-10201	03
ARG-10120	***************	B68-10182	01
ARG-10124		B68-10185	01
ARG-10136		B68-10283	01
ARG-10138	*********	B68-10291	01
ARG-10141	*********	B68-10400	01
ARG-10144	******************	B68-10420	01
ARG-10146		B68-10292	06
ARG-10148		B68-10368	03
ARG-10154	******************	B68~10293	20
ARG-10160	********	B68-10359	05
ARG-10161		B68-10366	04
ARG-10170		B68~10454 B68~10426	03 S0
ARG-10173	***************	D00~10426	02

ARG~10177	B68-10418	02
ARG-10181	B68-10455	03
ARG-10182	B68-10407	05
ARG-10183	B68-10415	01
ARG-10191	B68-10294	02
ARG-10192	B68-10427	04
ARG-10195	B68-10424	04
ARG-10196	B68-10320	04
ARG-10200	B68-10408	03
ARG-10205	B68-10409	03
ARG-10208	B68-10414	03
ARG-10210	B68-10298	02
ARG-90088	B68-10098	02
ARG-90142	B68-10236	01
ARG-90143	B68-10193	06
ARG-90164	B68-10173	01
ARG-90175	B68-10191	03
ARG-90193	B68-10202	01
ARG-90237	B68-10088	01 04
ARG-90239	B68-10076	02
ARG-90250	B68-10243	03
ARG-90259	B68-10172 B68-10087	01
ARG-90260	10001	O.L
ERC-19	B68-10056	01
ERC-10003	B68-10206	04
ERC-10031	B68-10350	01
ERC-10055	B68-10437	01
ERC-10087	B68-10563	01
ERC-10093	B68-10537	05
ERC-10097	B68-10503	05
ERC-10102	B68-10538	05
ERC-10116	B68-10227	06
ERC-10136	B68-10438	01
ERC-10150	B68-10562	01
ERC-10151	B68-10347	02
ERC-10152	B68-10559	01
ERC-10178	B68-10564	02
ERC-10198	B68-10541	01
ERC-10206	B68-10435	06
ERC-10209	B68-10457	06
FRC-10012	B68-10188	01
FRC-10022	B68-10188	01
FRC-10031	B68-10233	01
GSFC-438	B68-10322	20
GSFC-483	B68-10079	01
GSFC-556	B68-10003	01
GSFC-03429	B68-10017	01
GSFC-07971	B68-10021	02
GSFC-09561	B68-10008	01
GSFC-10066	B68-10272	01
GSFC-10067	B68-10327	01
GSFC-10108	B68-10317	01
GSFC-10109	B68-10519	02
GSFC-10173	B68-10557	03
GSFC-10183	B68-10054	01
GSFC-10185	B68-10207	01 01
GSFC-10198	B68-10254 B68-10089	01
	B68-10321	01
GSFC-10222	B68-10069	01
GSFC-10283	B68-10035	05
GSFC-10284	B68-10001	01
GSFC-10305	B68-10315	01
GSFC-10343	B68-10104	03
GSFC-10358	B68-10325	01
GSFC-10362	B68-10009	06
GSFC-10413	B68-10384	01
GSFC-10487	B68-10431	01
GSFC-10547	B68-10136	02
GSFC-10576	B68-10336	01
GSFC-10686	B68-10255	02

#### ORIGINATOR/TECH BRIEF NUMBER INDEX

		_			
GSFC-10687	B68-10271	03	LEWIS-10518	B68-10433	03
GSFC-10688	B68-10273	01	LEWIS-10535	B68-10527	03
GSFC-90536	B68-10518	01	LEWIS-10543	B68-10411	01
GSFC-90549	B68-10002	01	LEWIS-10544	B68-10340	03
	20		LEWIS-10551	B68-10520	03
KSC-67-120	B68-10019	01		B68-10440	05
	B68-10551	05	LEWIS-10695	B68-10533	02
KSC-09957	B68-10560	02	LEWIS-10712	B68-10456	01
KSC-10127	B68-10061	01	LEWIS-10720	B68-10567	05
KSC-10167	B68-10444	05	LEWIS-90254	B68-10138	01
KSC-10186	B68-10290	01	LEWIS-90339	B68-10063	01
KSC-10196	B68-10168	05			
KSC-10237	B68-10378	03	M-FS-1422	B68-10049	03
100 1000, 00000000000000000000000000000	DOG 10070	0.0	M-FS-1422	B68-10038	05
LANGLEY-89	DC0-10104	01			
•	B68-10124	01	M-FS-11970	B68-10027	01
LANGLEY-10017	B68-10055	06	M-FS-12218	B68-10225	05
LANGLEY-10033	B68-10132	05	M-FS-12226	B68-10159	06
LANGLEY-10051	B68-10092	03	M-FS-12396	B68-10051	01
LANGLEY-10091	B68-10379	01	M-FS-12410	B68-10029	03
LANGLEY-10092	B68-10235	05	M-FS-12428	B68-10028	01
LANGLEY-10106	B68-10123	05	M-FS-12547	B68-10048	03
LANGLEY-10176	B68-10141	01	M-FS-12590	B68-10301	01
LANGLEY-10193	B68-10042	05	M-FS-12807	B68-10014	05
LANGLEY-10281	B68-10352	05		B68-10219	05
* * * * * * * * * * * * * * * * * * * *					
#	B68-10341	01	M-FS-13085	B68-10160	02
• • • • • • • • • • • • • • • • • • • •	B68-10226	06	M-FS-13131	B68-10043	03
LANGLEY-10294	B68-10542	01	M-FS-13132	B68-10043	03
LANGLEY-10375	B68-10452	06	M-FS-13152	B68-10302	03
LANGLEY-10376	B68-10446	06	M-FS-13155	B68-10050	06
LANGLEY-10407	B68-10554	04	M-FS-13202	B68-10447	06
LANGLEY-90194	B68-10064	05	M-FS-13290	B68-10078	05
			M-FS-13362	B68-10099	05
LEWIS-324	B68-10041	05	M-FS-13399	B68-10072	05
LEWIS-10106	B68-10215	03	M-FS-13599	B68-10093	01
	B68-10094	03		B68-10073	
			M-FS-13621		01
LEWIS-10117	B68-10107	05	M-FS-13638	B68-10004	05
LEWIS-10128	B68-10279	03	M-FS-13649	B68-10192	03
LEWIS-10129	B68-10118	01	M-FS-13737	B68-10544	01
LEWIS-10131	B68-10062	03	M-FS-13740	B68-10544	01
LEWIS-10143	B68-10386	01	M-FS-13749	B68-10544	01
LEWIS-10162	B68-10331	05	M-FS-13801	B68-10129	01
LEWIS-10252	B68-10097	06	M-FS-13898	B68-10258	01
LEWIS-10254	B68-10025	06	M-FS-13901	B68-10067	01
LEWIS-10255	B68-10451	06	M-FS-13948	B68-10130	01
	B68-10135	02		B68-10130	01
I DUTO A COOR					
LEWIS-10267	B68-10248	05	M-FS-13954	868-10016	01
LEWIS-10278	B68-10214	03	M-FS-13969	B68-10576	06
LEWIS-10281	B68-10558	01	M-FS-14004	B68-10162	05
LEWIS-10283	B68-10344	03	M-FS-14019	B68-10034	03
LEWIS-10296	B68-10441	05	M-FS-14023	B68-10031	03
LEWIS-10297	B68-10337	01	M-FS-14034	B68-10308	01
LEWIS-10325	B68-10381	03	M-FS-14042	B68-10074	01
LEWIS-10329	B68-10040	05	M-FS-14076	B68-10119	02
LEWIS-10344	B68-10224	01	M-FS-14088	B68-10013	02
1 DUTE 4 0 DE 0	B68-10405	06		B68-10026	
			M-FS-14096		05
LEWIS-10353	B68-10543	01	M-FS-14105	B68-10222	05
LEWIS-10355	B68-10380	03	M-FS-14115	B68-10166	01
LEWIS-10362	B68-10007	01	M-FS-14132	B68-10222	05
LEWIS-10366	B68-10367	01	M-FS-14133	B68-10252	02
LEWIS-10373	B68-10513	01	M-FS-14134	B68-10075	05
LEWIS-10376	B68-10085	03	M-FS-14137	B68-10222	05
LEWIS-10377	B68-10253	03	M-FS-14151	B68-10221	03
LEWIS-10378	B68-10095	03	M-FS-14185	B68-10070	01
LEWIS-10379	B68-10046	03	M-FS-14189	B68-10070	01
LEWIS-10380	B68-10032	03	M-FS-14198	B68-10127	06
T DUT	B68-10343	05		B68-10186	
					02 <sub>.8</sub>
LEWIS-10388	B68-10388	01	M-FS-14221	B68-10075	05
LEWIS-10393	B68-10528	03	M-FS-14248	B68-10126	02
LEWIS-10394	B68-10144	01	M-FS-14265	B68-10015	01
LEWIS-10395	B68-10216	06	M-FS-14267	B68-10260	02
LEWIS-10396	B68-10134	05	M-FS-14268	B68-10275	20
LEWIS-10397	B68-10270	05	M-FS-14270	B68-10288	05
LEWIS-10399	B68-10356	06	M-FS-14283	B68-10153	03
LEWIS-10401	B68-10370	01	M-FS-14296	B68-10033	06
		01	M-FS-14309	B68-10546	02
Ltwis-10402 acassassassassassassassassassassassassas	B68-10145		M-FS-14310	B68-10108	02
LEWIS-10402	B68-10145				
LEWIS-10403	B68-10176	05			
LEWIS-10403	B68-10176 B68-10249	05 05	M-FS-14314	B68-10044	06
LEWIS-10403	B68-10176 B68-10249 B68-10423	05 05 06	M-FS-14314 M-FS-14323	B68-10044 B68-10306	06 01
LEWIS-10403 LEWIS-10408 LEWIS-10409 LEWIS-10424	B68-10176 B68-10249 B68-10423 B68-10369	05 05 06 03	M-FS-14314	B68-10044 B68-10306 B68-10306	06 01 01
LEWIS-10403 LEWIS-10408 LEWIS-10409 LEWIS-10424 LEWIS-10422	B68-10176 B68-10249 B68-10423 B68-10369 B68-10165	05 05 06 03 05	M-FS-14314	B68-10044 B68-10306 B68-10306 B68-10179	06 01
LEWIS-10403	B68-10176 B68-10249 B68-10423 B68-10369	05 05 06 03	M-FS-14314	B68-10044 B68-10306 B68-10306	06 01 01
LEWIS-10403 LEWIS-10408 LEWIS-10409 LEWIS-10424 LEWIS-10432	B68-10176 B68-10249 B68-10423 B68-10369 B68-10165	05 05 06 03 05	M-FS-14314 M-FS-14323 M-FS-14324 M-FS-14328	B68-10044 B68-10306 B68-10306 B68-10179	06 01 01 02
LEWIS-10403	B68-10176 B68-10249 B68-10423 B68-10369 B68-10165 B68-10382	05 05 06 03 05	M-FS-14314 M-FS-14323 M-FS-14324 M-FS-14324 M-FS-14342	B68-10044 B68-10306 B68-10306 B68-10179 B68-10080	06 01 01 02 05 02
LEWIS-10403 LEWIS-10408 LEWIS-10409 LEWIS-10424 LEWIS-10432 LEWIS-10437 LEWIS-10443 LEWIS-10444	B68-10176 B68-10249 B68-10423 B68-10369 B68-10165 B68-10382 B68-10556 B68-10526	05 05 06 03 05 01 02	M-FS-14314 M-FS-14323 M-FS-14324 M-FS-14328 M-FS-14342 M-FS-14357 M-FS-14388	B68-10044 B68-10306 B68-10306 B68-10179 B68-10080 B68-10081 B68-10143	06 01 01 02 05 02 02
LEWIS-10403 LEWIS-10408 LEWIS-10409 LEWIS-10424 LEWIS-10432 LEWIS-10437 LEWIS-10443 LEWIS-10444 LEWIS-10446	B68-10176 B68-10249 B68-10423 B68-10369 B68-10165 B68-10382 B68-10526 B68-10526	05 05 06 03 05 01 02 03 01	M-FS-14314 M-FS-14323 M-FS-14324 M-FS-14328 M-FS-14357 M-FS-14357 M-FS-14368 M-FS-14486	B68-10044 B68-10306 B68-10306 B68-10179 B68-10080 B68-10081 B68-10143 B68-10573	06 01 01 02 05 02 02
LEWIS-10403 LEWIS-10408 LEWIS-10409 LEWIS-10424 LEWIS-10432 LEWIS-10443 LEWIS-10444 LEWIS-10446 LEWIS-10458	B68-10176 B68-10249 B68-10423 B68-10369 B68-10165 B68-10556 B68-10556 B68-10566	05 05 06 03 05 01 02 03 01	M-FS-14314 M-FS-14323 M-FS-14324 M-FS-14328 M-FS-14342 M-FS-14357 M-FS-14388 M-FS-14488	B68-10044 B68-10306 B68-10306 B68-10179 B68-10080 B68-10081 B68-10143 B68-10573 B68-10232	06 01 01 02 05 02 02 05 06
LEWIS-10403 LEWIS-10408 LEWIS-10409 LEWIS-10424 LEWIS-10432 LEWIS-10437 LEWIS-10443 LEWIS-10444 LEWIS-10446 LEWIS-10458 LEWIS-10479	B68-10176 B68-10249 B68-10423 B68-10369 B68-10165 B68-10362 B68-10526 B68-10526 B68-10361 B68-10361	05 05 06 03 05 01 02 03 01 06 03	M-FS-14314 M-FS-14323 M-FS-14324 M-FS-14328 M-FS-14342 M-FS-14357 M-FS-14388 M-FS-14456 M-FS-14468 M-FS-14468	B68-10044 B68-10306 B68-10306 B68-10179 B68-10080 B68-10081 B68-10143 B68-10573 B68-10232 B68-10232	06 01 01 02 05 02 02 05 06 05
LEWIS-10403 LEWIS-10408 LEWIS-10409 LEWIS-10424 LEWIS-10432 LEWIS-10443 LEWIS-10444 LEWIS-10446 LEWIS-10458	B68-10176 B68-10249 B68-10423 B68-10369 B68-10165 B68-10556 B68-10556 B68-10566	05 05 06 03 05 01 02 03 01	M-FS-14314 M-FS-14323 M-FS-14324 M-FS-14328 M-FS-14342 M-FS-14357 M-FS-14388 M-FS-14488	B68-10044 B68-10306 B68-10306 B68-10179 B68-10080 B68-10081 B68-10143 B68-10573 B68-10232	06 01 01 02 05 02 02 05 06

## ORIGINATOR/TECH BRIEF NUMBER INDEX

		B68-10363	20	M-FS-18337 B68-10383	05
		B68-10257	05	M-FS-18345 B68-10517	02
		B68-10310	01	M-FS-18416 B68-10417	05
		B68-10312	01	M-FS-20013 B68-10434	01
M-FS-14542		B68-10268	01	M-FS-20039 B68-10349	20
M-FS-14545		B68-10149	01	M-FS-20049 B68-10432	01
M-FS-14552		B68-10131	01	M-FS-20058 B68-10406	02
M-FS-14574		B68-10091	01	M-FS-20083 B68-10534	05
M-FS-14575	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	B68-10146	03	M-FS-20084 B68-10357	01
		B68-10247	05	M-FS-20088 B68-10571	02
		B68-10307	01	M-FS-20091 B68-10430	01
		B68-10239	05	M-FS-20126	05
		B68-10259	02	M-FS-20127 B68-10412	01
		B68-10112	01	M-FS-20140 B68-10371	05
		B68-10171	01		02
		B68-10261	05		01
			-		
		B68-10217	06	M-FS-20175 B68-10536	03
		B68-10263	01	M-FS-20176 B68-10395	05
	*******	B68-10218	01	M-FS-20185 B68-10392	03
	**********	B68-10264	01	M-FS-20187 B68-10391	03
	***********	B68-10228	02	M-FS-20188 B68-10508	02
		B68-10442	05	M-FS-20202 B68-10397	01
M-FS-14690	*************	B68-10030	01	M-FS-20209 B68-10568	03
		B68-10309	01	M-FS-20224 B68-10566	01
M-FS-14695		B68-10296	06	M-FS-20246 B68-10413	01
M-FS-14696		B68-10240	02	M-FS-20292 B68-10574	02
M-FS-14698		B68-10572	01	M-FS-91326 B68-10039	05
M-FS-14703	*******	B68-10262	01	•	
M-FS-14710		B68-10300	05	MSC-533 B68-10036	05
	**************	B68-10303	01	MSC-716 B68-10128	02
M-FS-14715		B68-10287	06	MSC-10285 B68-10277	05
		B68-10334	03	MSC-10964 B68-10178	02
		B68-10161	05	MSC-10966 B68-10521	02
		B68-10256	03	MSC-11026 B68-10010	02
	****************	B68-10549	05	MSC-11108 B68-10115	05
	**********	B68-10525	01	MSC-11148 B68-10133	01
		B68-10569	02	MSC-11167 B68-10057	05
M-FS-14788	*************	B68-10570	02	MSC-11231 B68-10163	01
		B68-10505	01	MSC-11235 B68-10133	01
		B68-10183	01	MSC-11241 B68-10105	03
		B68-10311	01	MSC-11323 B68-10120	05
		B68-10276	SO	MSC-11353 B68-10329	02
M-FS-14803		B68-10313	01	MSC-11354 B68-10060	02
M-FS-14806	*******	B68-10360	03	MSC-11369 B68-10106	01
M-FS-14808		B68-10396	02	MSC-11377 B68-10117	05
M~FS-14815		B68-10548	02	MSC-11388 B68-10140	01
M-FS-14817	********	B68-10184	03	MSC-11447 B68-10220	01
M-FS-14821		B68-10180	05	MSC-11464 B68-10037	05
		B68-10509	05	MSC-11473 B68-10156	01
		B68-10393	05	MSC-11494 B68-10022	05
	• • • • • • • • • • • • • • • • • • • •	B68-10339	20	MSC-11554 B68-10234	02
		B68-10504	02	MSC-11555 B68-10066	03
	**************	B68-10351	03	MSC-11560 B68-10170	02
	********	B68-10401	05	MSC-11562 B68-10011	05
		B68-10390	03	MSC-11584 B68-10304	02
		B68-10429	01	MSC-11587 B68-10205	01
		B68-10348	02	MSC-11594 B68-10155	01
M-FS-14929	***************	B68-10346	02	MSC-11597 B68-10116	01
M-FS-14937		B68-10404	01	MSC-11599 B68-10213	01
M-FS-14972		B68-10353	05	MSC-11600 B68-10241	01
M-FS-14979	********	B68-10532	03	MSC-11604 B68-10177	03
M-FS-14980		B68-10515	05	MSC-11606 B68-10237	05
		B68-10274	03	MSC-11609 B68-10047	05
		B68-10443	01	MSC-11645 B68-10167	03
		B68-10333	01	MSC-11646 B68-10167	03
	•••••	B68-10448	06	MSC-11647 B68-10167	03
		B68-10416	06	MSC-11656 B68-10151	01
		B68-10529	01	MSC-11666 B68-10230	01
		B68-10565	01	MSC-11688 B68-10245	20
		B68-10422	06	MSC-11697 B68-10324	04
	***********	B68-10575	05	MSC-11698 B68-10324	04
	••••••	B68-10530	05	MSC-11699 B68-10324	04
		B68-10154	02	MSC-11774 B68-10374	06
	****************	B68-10332	05	MSC-11777 B68-10375	06
		B68-10158	06	MSC-11780 B68-10376	06
		B68-10282	02	MSC-11781 B68-10377	06
		B68-10265	02	MSC-11824 B68-10305	01
		B68-10531	05	MSC-11825 B68-10289	01
** ** * * * * * * * * * * * * * * * * *	••••••••	B68-10355	03	MSC-11827 B68-10555	01
		B68-10522	03	MSC-11839 B68-10398	05
		B68-10285	03	MSC-11869 B68-10246	01
		B68-10286	05	MSC-12001 B68-10330	01
		B68-10251	03	MSC-12055 B68-10071	02
	********	B68-10523	03	MSC-12059 B68-10114	01
	*********	B68-10394	03	MSC-12060 B68-10086	01
		B68-10299	05	MSC-12068 B68-10242	01
		B68-10439	05	MSC-12071 B68-10111	05
M-FS-18327		B68-10385	03	MSC-12072 B68-10110	05

#### ORIGINATOR/TECH BRIEF NUMBER INDEX

MSC-12074	***************	B68-10157	01
MSC-12078		B68-10018	01
MSC-12101		B68-10238	01
MSC-12123	*******	B68-10121	01
MSC-12206		B68-10500	04
MSC-13060	000000000000000000000000000000000000000	B68-10387	05
MSC-13061		B68-10512	05
MSC-13086	• • • • • • • • • • • • • • • • • • • •		
		B68-10314	01
MSC-15002		B68-10403	06
MSC-15022		B68-10540	05
MSC-15108		B68-10362	01
MSC-15170		B68-10510	20
MSC-90180		B68-10501	01
MSC-90645		B68-10052	05
NPO-09975		B68-10059	01
NPO-10007		B68-10297	05
NPO-10070	*********	B68-10524	03
NPO-10118	*******	B68-10058	01
NPO-10150		B68-10045	06
NPO-10174		B68-10113	02
NPO-10185	**************	B68-10402	01
NPO-10214		B68-10428	01
NPO-10228		B68-10082	05
NPO-10230	*********	B68-10547	01
NPO-10233	********	B68-10316	01
NPO-10238	********	B68-10502	01
NPG-10243		B68-10507	05
NPO-10298	*************	B68-10142	03
NPO-10337		B68-10090	02
NPO-10348		B68-10152	01
NPO-10340		B68-10132	01
NPO-10429			
		B68-10005	06
NPO-10438	**********	B68-10137	06
NPO-10467	****************	B68-10506	02
NPO-10501		B68-10139	06
NPO-10502		B68-10096	06
NPO-10547	*********	B68-10338	05
NPO-10548		B68-10244	01
NPO-10560		B68-10514	01
NPO-10563		B68-10436	01
NPO-10584		B68-10516	01
NPO-10588	• • • • • • • • • • • • • • • • • • • •	B68-10421	06
NPO-10589	*********	B68-10208	06
NPO-10598		B68-10187	06
NPO-10603	********	B68-10354	06
NPO-10752		B68-10410	06
NPO-10754		B68-10514	01
NPO-10756	******	B68-10449	06
NPO-10783		B68-10552	03
NPO-10785		B68-10553	03
NUC-10147	*********	B68-10147	01
NUC-10153	*******	B68-10122	05
NUC-10163		B68-10148	01
NUC-10189	***************	B68-10450	06
NUC-10301	000000000000000000000000000000000000000	B68-10006	06
NUC-10302		B68-10023	03
NUC-10303		B68-10053	05
NUC-10304		B68-10024	05
NUC-10537		B68-10150	
MOC-10221	********	D00-10130	06
CAN10002		DCG 10200	0.5
SAN-10002	********	B68-10209	05
SAN-10003		B68-10231	04
SAN-10004	********	B68-10223	01
SAN-10006		B68-10212	03
SAN-10007	* * * * * * * * * * * * * * * * * * * *	B68-10211	05
SAN-10012		B68-10204	03
SAN-10013		B68-10269	01
SAN-10014	**********	B68-10389	01
SAN-10019		B68-10266	05
SAN-10020	*********	B68-10267	01
SAN-10021	********	B68-10318	05
SAN-10024		B68-10342	01
SAN-10025	*******	B68-10373	03
SAN-10028		B68-10445	06
SAN-10030	**********	B68-10419	03
Dine 20000		DOO 10415	•
XAC-10608	*******	B68-10084	01
ARC 10000	********************	D00-10004	O1
XFR-03838		B69_10100	01
		B68-10100	
XFR-05421	* * * * * * * * * * * * * * * * * * * *	B68-10250	05
V00_01000		BC0 10000	0.4
XGS-01222	*********	B68-10068	01
XGS-08566		B68-10364	01
XGS-10017	******	B68-10399	01
XGS-11379		B68-10012	01

RIEF	NUMBER IND	EX		
	XNP-08124 XNP-10849		• 6 9 8 9 9 9 9 9 9 9 9	B68-10020 B68-10535
	· .			

# TECH BRIEF/ORIGINATOR NUMBER INDEX -

Issue 8

### Tech Brief/Originator Number Index

The left hand column identifies the Tech Brief number, e.g., B68-10023, followed by a two-digit number, e.g., 01, which identifies the subject category containing the entire citation. Following the subject category number is the originator number.

B68-10001	01	GSFC-10284
B68-10002	01	GSFC-90549
B68-10003	01	GSFC-556
B68-10004	05	M-FS-13638
B68-10005	06	NPO-10429
B68-10006	06	NUC-10301
B68-10007	01	LEWIS-10362
B68-10008	01	GSFC-09561
B68-10009	06	GSFC-10362
B68-10010	02	MSC-11026
B68-10011	05	MSC-11562
B68-10012	01	XGS-11379
B68-10013	02	M-FS-14088
B68-10014	05	M-FS-12807
B68-10015	01	M-FS-14265
B68-10016	01	
B68-10017	01	GSFC-03429
B68-10018	01	MSC-12078
B68-10019	01	KSC-67-120
B68-10020	03	XNP-08124
B68-10021	02	GSFC-07971
B68-10022	05	MSC-11494
B68-10023	03	NUC-10302
B68-10024	05	NUC-10304
B68-10025	06	LEWIS-10254
B68-10026	05	
B68-10027	01	M-FS-11970
B68-10028	01	
B68-10029	03	
B68-10030	01	
B68~10031	03	M-FS-14023
B68-10032	03	LEWIS-10380
B68-10033	06	
B68~10034	03	M-FS-14019
B68-10035	05	GSFC-10283
B68-10036	05	
B68~10037	05	MSC-11464
B68~10038	05	M-FS-1697
B68~10039	05	M-FS-91326
B68~10040	05	LEWIS-10329
B68-10041	05	LEWIS-324
B68~10041	05	LANGLEY-10193
B68~10042	03	M-FS-13131
B68~10043	03	M-FS-13132
B68~10044	06	M-FS-14314
B68-10045	06	NPO-10150
B68-10045	03	LEWIS-10379
B68~10047	05	MSC-11609
B68-10047	03	M-FS-12547
B68-10049	03	M-FS-1422
DOO-10043	03	••••••••••••••••••••••••••••••••••••••

B68-10050	06	M-FS-13155
B68-10051	01	M-FS-12396
B68-10052	05	MSC-90645
	05	
B68-10053		
B68-10054	01	GSFC-10183
B68-10055	06	LANGLEY-10017
B68-10056	01	ERC-19
B68-10057	05	
B68-10058	01	NPO-10118
B68-10059	01	NPO-09975
B68-10060	02	MSC-11354
B68-10061	01	MSC-11354 KSC-10127
		TRUTO 10101
B68-10062	03	LEWIS-10131
B68-10063	01	LEWIS-90339
B68-10064	05	LANGLEY-90194
B68-10065	01	ARC-10083
	03	MSC-11555
B68-10066		
B68-10067	01	M-FS-13901
B68-10068	01	XGS-01222
B68-10069	01	GSFC-10271
B68-10070	01	
000-10070		
B68-10070	01	M-FS-14189
B68-10071	02	MSC-12055
B68-10072	05	M-FS-13399
B68-10073	01	M-FS-13621
B68-10074	01	M-FS-14042
B68-10075	05	M-FS-14134
B68-10075	05	M-FS-14221
B68-10076	04	ARG-90239
B68-10077	20	ARG-10109
B68-10078	05	M-FS-13290
B68-10079	01	GSFC-483
B68-10080	05	M-FS-14342
B68-10081	02	M-FS-14357
B68-10082	05	NPO-10228
B68-10083	01	ARG-10114
B68-10084	01	XAC-10608
B68-10085	03	LEWIS-10376
B68-10086	01	MSC-12060
B68-10087	01	ARG-90260
B68-10088	01	ARG-90237
B68-10089	01	GSFC-10212
B68-10090	02	NPO-10337
B68-10091	01	M-FS-14574
B68-10092	03	
B68-10093	01	M-FS-13599
B68-10094	03	LEWIS-10115
B68-10095	03	LEWIS-10378
B68-10096	06	NPO-10502
B68-10097	06	LEWIS-10252
B68-10098	02	ARG-90088
B68-10099	05	M-FS-13362
368-10100	01	XFR-03838
368-10101	03	ARG-10086
868-10102	03	ARG-10087
B68-10103	03	ARG-10075
B68-10104	03	GSFC-10343
B68-10105	03	MSC-11241
B68-10106	01	MSC-11369
B68-10107	05	LEWIS-10117
B68-10108	20	M-FS-14310
B68-10109	03	ARG-10059
B68-10110	05	MSC-12072
B68-10111	05	MSC-12071
B68-10112	01	M-FS-14608
B68-10113	20	NPO-10174
B68-10114	01	MSC-12059
B68-10115	05	MSC-11108
B68-10116	01	MSC-11597
B68-10117	05	MSC-11377
B68-10118	01	LEWIS-10129
B68-10119	05	
B68-10120	05	MSC-11323
B68-10121	01	MSC-12123

### TECH BRIEF/ORIGINATOR NUMBER INDEX

B68-10122	05	********	NUC-10153	B68-10205	01	MSC-11587
B68-10123	05		SLEY-10106	B68-10206	04	ERC-10003
B68-10124	01	I	LANGLEY-89	B68-10207	01	GSFC-10185
B68-10125	05	••••••	1-FS-14496	B68-102 <b>0</b> 8	06	NPO-10589
B68-10126	02		1-FS-14248	B68-10209	05	
B68-10127	06		1-FS-14198	B68-10210	01	ARC-10146
B68-10128	20		MSC-716	B68-10211	05	SAN-10007
B68-10129	01	N	1-FS-13801	B68-10212	03	
B68-10130	01	N	1-FS-13948	B68-10213	01	MSC-11599
B68-10130	01		1-FS-13950	B68-10214	03	LEWIS-10278
B68-10131	01		1-FS-14552	B68-10215	03	LEWIS-10106
B68-10132	05		SLEY-10033	B68-10216	06	LEWIS-10395
B68-10133	01	******	MSC-11148	B68-10217	06	M-FS-14654
B68-10133	01	*****************	MSC-11235	B68-10218	01	M-FS-14661
B68-10134	05		EWIS-10396	B68-10219	05	M-FS-13007
B68-10135	02	LE	EWIS-10265	B68-10220	01	MSC-11447
B68-10136	02	•••••	3SFC-10547	B68-10221	03	M-FS-14151
B68-10137	06		NPO-10438	B68-10222	05	M-FS-14105
B68-10138	01	LE	EWIS-90254	B68-10222	05	M-FS-14132
B68-10139	06	******	NPO-10501	B68-10222	05	M-FS-14137
B68-10140	01		MSC-11388	B68-10223	01	SAN-10004
B68-10141	01		SLEY-10176	B68-10224	01	LEWIS-10344
B68-10142	03	*******************	NPO-10298	B68-10225	05	M-FS-12218
B68-10143	02		1-FS-14388	B68-10226	06	
						· · · · · · · · · · · · · · · · · · ·
B68-10144	01		EWIS-10394	B68-10227	06	
B68-10145	01		EWIS-10402	B68-10228	02	M-FS-14679
B68-10146	03		1-FS-14575	B68-10229	05	M-FS-14480
B68-10147	01	***********	NUC-10147	B68-10230	01	MSC-11666
B68-10148	01		NUC-10163	B68-10231	04	SAN-10003
B68-10149	01		1-FS-14545	B68-10232	06	M-FS-14468
B68-10150	06		NUC-10537	B68-10233	01	FRC-10031
B68-10151	01		MSC-11656	B68-10234	02	MSC-11554
B68-10152	01		NPO-10348	B68-10235	05	LANGLEY-10092
B68-10153	03		1-FS-14283	B68-10236	01	ARG-90142
B68-10154	02		1-FS-18003	B68-10237	05	MSC-11606
B68-10155	01		MSC-11594	B68-10238	01	MSC-12101
B68-10156	01		MSC-11473	B68-10239	05	
		******************	MSC-12074			
B68-10157	01			B68-10240	02	
B68-10158	06		M-FS-18045	B68-10241	01	MSC-11600
B68-10159	06		M-FS-12226	B68-10242	01	MSC-12068
B68-10160	- 02		1-FS-13085	B68-10243	02	ARG-90250
B68-10161	05	h	4-FS-14743	B68-10244	01	NPO-10548
B68-10162	05	······	1-FS-14004	B68-10245	02	MSC-11688
B68-10163	01		MSC-11231	B68-10246	01	MSC-11869
B68-10164	06		ARC-10130	B68-10247	05	M-FS-14579
B68-10165	05		EWIS-10432	B68-10248	05	LEWIS-10267
B68-10166	01		4-FS-14115	B68-10249	05	LEWIS-10408
B68-10167	03		MSC-11645	B68-10250	05	XFR-05421
B68-10167	03		MSC-11646	B68-10251	03	
B68-10167	03	********************	MSC-11647	B68-10252	02	
B68-10168	05	**********	KSC-10196	B68-10253	03	LEWIS-10377
B68-10169	04	• • • • • • • • • • • • • • • • • • • •	ARG-10064	B68-10254	01	GSFC-10198
B68-10170	92	*****************	MSC-11560	B68-10255	02	GSFC-10686
B68-10171	01		M-FS-14634	B68-10256	03	M-FS-14764
B68-10172	03		ARG-90259	B68-10257	05	
B68-10173	01		ARG-90164	B68-10258	01	M-FS-13898
B68-10174	02		ARG-10094	B68-10259	02	
B68-10175	01		ARC-10060	B68-10260	02	M-FS-14267
B68-10176	05	LE	EWIS-10403	B68-10261	05	
B68-10177	. 03		MSC-11604	B68-10262	01	M-FS-14703
B68-10178	02	*****************	MSC-10964	B68-10263	01	M-FS-14656
B68-10179	02		M-FS-14328	B68-10264	01	M-FS-14672
B68-10180	05		M-FS-14821	B68-10265	02	M-FS-18076
B68-10181	02		ARG-10102	B68-10266	05	SAN-10019
B68-10182	01	**************	ARG-10120	B68-10267	01	SAN-10020
B68-10183	01		M-FS-14790	B68-10268	01	
B68-10184	03		M-FS-14817	B68-10269	01	SAN-10013
B68-10185	01		ARG-10124	B68-10270	05	LEWIS-10397
B68-10186	20		M-FS-14217	B68-10271	03	
B68-10187	06	• • • • • • • • • • • • • • • • • • • •	NPO-10598	B68-10272	01	
B68-10188	01	• • • • • • • • • • • • • • • • • • • •	FRC-10012	B68-10273	01	GSFC-10688
B68-10188	01	• • • • • • • • • • • • • • • • • • • •	FRC-10022	B68-10274	03	M-FS-14991
B68-10189	03	*******	ARG-10051	B68-10275	02	M-FS-14268
B68-10190	20	•••••••	ARG-10035	B68-10276	02	M-FS-14802
B68-10191	03	• • • • • • • • • • • • • • • • • • • •	ARG-90175	B68-10277	05	MSC-10285
B68-10192	03		M-FS-13649	B68-10278	03	ARG-10049
B68-10193	06	*********	ARG-90143	B68-10279	03	LEWIS-10128
B68-10194	03	• • • • • • • • • • • • • • • • • • • •	ARG-10115	B68-10280	01	ARG-10057
	03	*******	ARG-10062	B68-10281	03	ARG-10085
B68-10195			ARG-10067	B68-10282	02	M-FS-18062
			ARG-10074	B68-10283	01	ARG-10136
B68-10196	03					
B68-10196 B68-10197	03 03		ARG-10092	B68-10284	05	ARG-10100
B68-10196 B68-10197 B68-10198	03 03 03		ARG-10092 ARG-10099	868-10284 868-10285	05 03	ARG-10100
B68-10196 B68-10197 B68-10198 B68-10199	03 03 03 03		ARG-10099	B68-10285	03	M-FS-18174
B68-10196 B68-10197 B68-10198 B68-10199 B68-10200	03 03 03 03 03	•••••	ARG-10099 ARG-10108	B68-10285 B68-10286	03 05	M-FS-18174 M-FS-18179
868-10196 868-10197 868-10198 868-10199 868-10200 868-10201	03 03 03 03 03		ARG-10099 ARG-10108 ARG-10119	B68-10285 B68-10286 B68-10287	03 05 06	M-FS-18174 M-FS-18179 M-FS-14715
B68-10196 B68-10197 B68-10198 B68-10199 B68-10200 B68-10201 B68-10202	03 03 03 03 03 03	••••••	ARG-10099 ARG-10108 ARG-10119 ARG-90193	B68-10285 B68-10286 B68-10287 B68-10288	03 05 06 05	M-FS-18174 M-FS-18179 M-FS-14715 M-FS-14270
B68-10196 B68-10197 B68-10198 B68-10299 B68-10200 B68-10201 B68-10202 B68-10203	03 03 03 03 03 03 01	••••••	ARG-10099 ARG-10108 ARG-10119 ARG-90193 NPO-10350	868-10285 868-10286 868-10287 868-10288 868-10289	03 05 06 05 01	M-FS-18174 M-FS-18179 M-FS-14715 M-FS-14715 M-FS-14270 MSC-11825
B68-10196 B68-10197 B68-10198 B68-10199 B68-10200 B68-10201 B68-10202	03 03 03 03 03 03	••••••	ARG-10099 ARG-10108 ARG-10119 ARG-90193	B68-10285 B68-10286 B68-10287 B68-10288	03 05 06 05	M-FS-18174 M-FS-18179 M-FS-14715 M-FS-14270

#### TECH BRIEF/ORIGINATOR NUMBER INDEX

B68-10291	01		ARG-10138	B68-10376	06	MSC-11780
B68-10292	06		ARG-10146	B68-10377	06	MSC-11781
B68-10293	02		ARG-10154	B68-10378	03	KSC-10237
B68-10294	02	*********	ARG-10191	B68-10379	01	LANGLEY-10091
B68-10295	05	*******	LEWIS-10483	B68-10380	03	LEWIS-10355
B68-10296	06	*******	M-FS-14695	B68-10381	03	LEWIS-10325
B68-10297	05	••••••	NPO-10007	B68-10382	01	LEWIS-10437
B68-10298	20	••••••	ARG-10210	B68-10383	05	M-FS-18337
B68-10299	05		M-FS-18194	B68-10384	01	GSFC-10413
B68-10300	05		M-FS-14710	B68-10385	03	M-FS-18327
B68-10301	01		M~FS-12590	B68-10386	01	LEWIS-10143
B68-10302	03	******	M-FS-13152	B68-10387	05	MSC-13060
B68-10303	01	*******	M-FS-14713	B68-10388	01	LEWIS-10388
B68-10304	02	***************	MSC-11584	B68-10389	01	SAN-10014
B68-10305	01		MSC-11824	B68-10390	03	M-FS-14910
B68-10306	01		M-FS-14323	B68-10391	03	M-FS-20187
B68-10306	01		M-FS-14324	B68-10392	03	M-FS-20185
B68-10307	01	000000000000000000000000000000000000000	M-FS-14581	B68-10393	05	M-FS-14841
B68-10308	01	******	M-FS-14034	B68-10394	03	M-FS-18191
B68-10309	01	999040404040404040	M-FS-14691	B68-10395	05	M-FS-20176
B68-10310	01	• • • • • • • • • • • • • • • • • • • •	M-FS-14531	B68-10396	02	M-FS-14808
B68-10311	01	*******	M-FS-14791	B68-10397	01	M-FS-20202
B68-10312	01		M-FS-14541	B68-10398	05	MSC-11839
B68-10313	01	444444444444444	M-FS-14803	B68-10399	01	XGS-10017
B68-10314	01	0.9.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.	MSC-13086	B68-10400	01	ARG-10141
B68-10315	01		GSFC-10305	B68-10401	05	** **
B68-10316	01		NPO-10233	B68-10401	01	M-FS-14874 NPO-10185
B68-10317	01	* * * * * * * * * * * * * * * * * * * *	GSFC-10108	B68-10403		MSC-15002
B68-10318	05		SAN-10021	B68-10403	06 01	M-FS-14937
B68-10319			LEWIS-10446	B68-10405		
B68-10319	01 04	*******			06	
			ARG-10196	B68-10406	02	
B68-10321	01		GSFC-10222	B68-10407	05	ARG-10182
B68-10322	02			B68-10408	03	ARG-10200
B68-10323	01	*******	LEWIS-10487	B68-10409	03	ARG-10205
B68-10324	04		MSC-11697	B68-10410	06	NPO-10752
B68-10324	04	•••••••	MSC-11698	B68-10411	01	LEWIS-10543
B68-10324	04		MSC-11699	B68-10412	01	M-FS-20127
B68-10325	01		GSFC-10358	B68-10413	01	M-FS-20246
B68-10326	02	*******************	ARG-10101	B68-10414	03	ARG-10208
B68-10327	01	••••••	GSFC-10067	B68-10415	01	ARG-10183
B68-10328	01		ARG-10110	B68-10416	06	M-FS-15002
B68-10329	62		MSC-11353	B68-10417	05	
B68-10330	01		MSC-12001	B68-10418	02	ARG-10177
B68-10331	05	******	LEWIS-10162	B68-10419	03	SAN-10030
B68-10332	05		M-FS-18037	B68-10420	01	ARG-10144
B68-10333	01	***********	M-FS-14996	B68-10421	06	NPO-10588
B68-10334	03		M-FS-14720	B68-10422	06	
B68-10335	06	****************	ARC-10141	B68-10423	06	LEWIS-10409
B68-10336	01		GSFC-10576	B68-10424	04	ARG-10195
B68-10337	01		LEWIS-10297	B68-10425	03	ARG-10065
B68-10338	05		NPO-10547	B68-10426	02	ARG-10173
B68-10339	02		M-FS-14845	B68-10427	04	ARG-10192
B68-10340	03	********	LEWIS-10544	B68-10428	01	
B68-10341	01	L	ANGLEY-10289	B68-10429	01	M-FS-14914
B68-10342	01	***************	SAN-10024	B68-10430	01	M-FS-20091
B68-10343	05	********	LEWIS-10382	B68-10431	01	GSFC-10487
B68-10344	03		LEWIS-10283	B68-10432	01	M-FS-20049
B68-10345	92		M-FS-20143	B68-10433	03	LEWIS-10518
B68-10346	02	********	M-FS-14929	B68-10434	01	M-FS-20013
B68-10347	20		ERC-10151	B68-10435	06	ERC-10206
B68-10348	02	**********	M-FS-14915	B68-10436	01	NPO-10563
B68-10349	02		M-FS-20039	B68-10437	01	ERC-10055
B68-10350	01	*****	ERC-10031	B68-10438	01	ERC-10136
B68-10351	03		M-FS-14856	B68-10439	05	M-FS-18298
B68-10352	05	L	ANGLEY-10281	B68-10440	05	LEWIS-10574
B68-10353	05		M-FS-14972	B68-10441	05	LEWIS-10296
B68-10354	06		NPO-10603	B68-10442	05	M-FS-14685
B68-10355	03	**********	M-FS-18150	B68-10443	01	
B68-10356	06		LEWIS-10399	B68-10444	05	KSC-10167
B68-10357	01	*******	M-FS-20084	B68-10445	06	SAN-10028
B68-10358	03	****************	ARC-10098	B68-10446	06	LANGLEY-10376
B68-10359	05	****************	ARG-10160	B68-10447	06	
B68-10360	03		M-FS-14806	B68-10448	06	M-FS-15001
B68-10361	06	• • • • • • • • • • • • • • • • • • • •	LEWIS-10458	B68-10449	06	NPO-10756
B68-10362	01	• • • • • • • • • • • • • • • • • • • •	MSC-15108	B68-10450	06	NUC-10189
B68-10363	02		M-FS-14522	B68-10451	06	
B68-10364	02		XGS-08566	B68-10451	06	
B68-10365	01		ARC-10174			
B68-10366	04		ARG-10174 ARG-10161	B68-10453 B68-10454	06 03	ARC-10168 ARG-10170
B68-10367	01	*******	LEWIS-10366	B68-10455	03	ARG-10181
B68-10368	03	* * * * * * * * * * * * * * * * * * * *	ARG-10148	B68-10456	01	LEWIS-10712
B68-10369	03		LEWIS-10424	B68-10457	06	ERC-10209
B68-10370	01		LEWIS-10401	B68-10500	04	MSC-12206
B68-10371	05	***********	M-FS-20140	B68-10501	01	MSC-90180
B68-10372 B68-10373	05		ARG-10027	B68-10502 B68-10503	01	NPO-10238
			SAN-10025	BN8-10503	05	ERC-10097
	03					
B68-10374 B68-10375	03 06 06		MSC-11774 MSC-11777	B68-10504 B68-10505	02 01	M-FS-14851 M-FS-14789

## TECH BRIEF/ORIGINATOR NUMBER INDEX

B68-10506	02	
B68-10507	05	NPO-10243
B68-10508	02	M-FS-20188
B68-10509	05	M-FS-14837
B68-10510	02	MSC-15170
B68-10511	01	M-FS-14511
B68-10512	05	/ Mag 18061
	01	
B68-10513		LEWIS-10373
B68-10514	01	NPO-10560
B68-10514	01	NPO-10754
B68-10515	05	M-FS-14980
B68-10516	01	
B68-10517	02	M-FS-18345
B68-10518	01	GSFC-90536
B68-10519	02	GSFC-10109
B68-10520	03	LEWIS-10551
B68-10521	02	MSC-10966
B68-10522	03	M-FS-18151
B68-10523	03	M-FS-18189
B68-10524	03	NDC 16676
B68-10525	01	N DG +4505
	03	I DUTG 10///
B68-10526		
B68-10527	03	LEWIS-10535
B68-10528	03	LEWIS-10393
B68-10529	01	M-FS-15016
B68-10530	05	M-FS-16196
B68-10531	05	M-FS-18146
B68-10532	03	M-FS-14979
B68-10533	02	LEWIS-10695
B68-10534	05	M-FS-20083
B68-10535	05	XNP-10849
B68-10536	03	M-FS-20175
B68-10537	05	ERC-10093
B68-10538	05	ERC-10102
B68-10539	01	ARC-10042
B68-10540	05	
B68-10541	01	ERC-10198
B68-10541 B68-10542	01 01	ERC-10198 LANGLEY-10294
B68-10541 B68-10542 B68-10543	01 01 01	ERC-10198 LANGLEY-10294 LEWIS-10353
B68-10541 B68-10542 B68-10543 B68-10544	01 01 01 01	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737
B68-10541 B68-10542 B68-10543 B68-10544 B68-10544	01 01 01 01 01	ERC-10198LANGLEY-10294LEWIS-10353M-FS-13737M-FS-13740
B68-10541 B68-10542 B68-10543 B68-10544 B68-10544 B68-10544	01 01 01 01 01	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13749
B68-10541 B68-10542 B68-10543 B68-10544 B68-10544 B68-10544 B68-10545	01 01 01 01 01 01	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13740 M-FS-13749 M-FS-20152
B68-10541 B68-10542 B68-10543 B68-10544 B68-10544 B68-10544 B68-10545 B68-10545	01 01 01 01 01 01 01	
B68-10541 B68-10542 B68-10543 B68-10544 B68-10544 B68-10545 B68-10545 B68-10547	01 01 01 01 01 01 01 02	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13749 M-FS-13749 M-FS-1052 M-FS-14309 M-FS-14309 NPD-10230
B68-10541 B68-10542 B68-10543 B68-10544 B68-10544 B68-10544 B68-10545 B68-10546 B68-10547 B68-10548	01 01 01 01 01 01 02 01	ERC-10198 LANGLEY-10294 LEWIS-10353
B68-10541 B68-10543 B68-10544 B68-10544 B68-10544 B68-10545 B68-10546 B68-10547 B68-10548	01 01 01 01 01 01 01 02 01 02	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13740 M-FS-13749 M-FS-20152 M-FS-14309 M-FS-14815 M-FS-14815
B68-10541 B68-10542 B68-10543 B68-10544 B68-10544 B68-10544 B68-10545 B68-10546 B68-10546 B68-10548 B68-10549	01 01 01 01 01 01 02 01 02 05	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13749 M-FS-20152 M-FS-14309 M-FS-14309 M-FS-14415 M-FS-14472 M-FS-20126
B68-10541 B68-10543 B68-10544 B68-10544 B68-10544 B68-10545 B68-10546 B68-10547 B68-10549 B68-10550 B68-10550	01 01 01 01 01 01 02 01 02 05 05	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13749 M-FS-20152 M-FS-14309 M-FS-144309 M-FS-144015 M-FS-14772 M-FS-20126 M-FS-20126 M-FS-14772 M-FS-20126 M-FS-20126 M-FS-20126 M-FS-20126 M-FS-20126 KSC-09955
B68-10541 B68-10543 B68-10544 B68-10544 B68-10544 B68-10545 B68-10545 B68-10547 B68-10549 B68-10549 B68-10550 B68-10551	01 01 01 01 01 01 02 01 02 05 05 05	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13740 M-FS-13740 M-FS-20152 M-FS-14309 M-FS-14309 M-FS-14405 M-FS-14405 M-FS-14405 M-FS-14772 M-FS-14772 M-FS-0126 M-FS-0126 M-FS-0126
B68-10541 B68-10542 B68-10544 B68-10544 B68-10544 B68-10545 B68-10547 B68-10547 B68-10548 B68-10549 B68-10551 B68-10550 B68-10552	01 01 01 01 01 01 02 01 02 05 05 05 03	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13749 M-FS-20152 M-FS-14309 M-FS-14309 M-FS-14815 M-FS-14615 M-FS-20126 KSC-09955 NPO-10783 NPD-10783
B68-10541 B68-10543 B68-10544 B68-10544 B68-10545 B68-10545 B68-10547 B68-10549 B68-10549 B68-10550 B68-10550 B68-10551 B68-10551 B68-10553 B68-10553	01 01 01 01 01 01 02 05 05 05 03 04	ERC-10198 LANGLEY-10294 LEWIS-10353
B68-10541 B68-10543 B68-10544 B68-10544 B68-10545 B68-10545 B68-10545 B68-10546 B68-10549 B68-10551 B68-10551 B68-10551 B68-10553 B68-10553 B68-10553	01 01 01 01 01 01 02 05 05 05 05 03 04 01	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13749 M-FS-20152 M-FS-14309 M-FS-14309 M-FS-144015 M-FS-144015 M-FS-10230 M-FS-14772 M-FS-0126 M-FS-14772 M-FS-0126 M-FS-0126 M-FS-14772 M-FS-1477
B68-10541 B68-10542 B68-10544 B68-10544 B68-10544 B68-10545 B68-10547 B68-10547 B68-10549 B68-10550 B68-10550 B68-10553 B68-10553 B68-10553 B68-10555 B68-10555	01 01 01 01 01 02 01 02 05 05 05 03 04 01 02	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13749 M-FS-20152 M-FS-20152 M-FS-14309 M-FS-14309 M-FS-14815 M-FS-14615 M-FS-1472 M-FS-1276 M-FS-10166
B68-10541 B68-10542 B68-10544 B68-10544 B68-10545 B68-10545 B68-10547 B68-10549 B68-10549 B68-10551 B68-10551 B68-10551 B68-10553 B68-10554 B68-10555 B68-10555 B68-10555 B68-10555	01 01 01 01 01 02 05 05 05 05 03 04 01 02 03	ERC-10198 LANGLEY-10294 LEWIS-10353
B68-10541 B68-10542 B68-10544 B68-10544 B68-10544 B68-10545 B68-10547 B68-10547 B68-10549 B68-10550 B68-10550 B68-10553 B68-10553 B68-10553 B68-10555 B68-10555	01 01 01 01 01 02 01 02 05 05 05 03 04 01 02	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13749 M-FS-20152 M-FS-14379 M-FS-14309 M-FS-144015 M-FS-144015 M-FS-10230 M-FS-10230 M-FS-14772 M-FS-0126 M-FS-14772 M-FS-14772 M-FS-14772 M-FS-14772 LEWIS-10407 MSC-11827 LEWIS-10443 GSFC-10173 LEWIS-10281
B68-10541 B68-10542 B68-10544 B68-10544 B68-10545 B68-10545 B68-10547 B68-10549 B68-10549 B68-10551 B68-10551 B68-10551 B68-10553 B68-10554 B68-10555 B68-10555 B68-10555 B68-10555	01 01 01 01 01 02 05 05 05 05 03 04 01 02 03	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13749 M-FS-20152 M-FS-20152 M-FS-14309 M-FS-14309 M-FS-14815 M-FS-14815 M-FS-14872 M-FS-20126 KSC-09955 NPD-10783 LANGLEY-10407 MSC-11827 LEWIS-10443 GSFC-10173 LEWIS-10281 LEWIS-10281
B68-10542 B68-10543 B68-10544 B68-10544 B68-10545 B68-10545 B68-10546 B68-10547 B68-10549 B68-10551 B68-10551 B68-10552 B68-10555 B68-10555 B68-10555 B68-10555	01 01 01 01 01 02 01 02 05 05 05 03 04 01 02	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13749 M-FS-20152 M-FS-14379 M-FS-14309 M-FS-144015 M-FS-144015 M-FS-10230 M-FS-10230 M-FS-14772 M-FS-0126 M-FS-14772 M-FS-14772 M-FS-14772 M-FS-14772 LEWIS-10407 MSC-11827 LEWIS-10443 GSFC-10173 LEWIS-10281
B68-10541 B68-10542 B68-10544 B68-10544 B68-10544 B68-10545 B68-10547 B68-10547 B68-10549 B68-10550 B68-10550 B68-10553 B68-10553 B68-10555 B68-10555 B68-10555 B68-10555 B68-10555	01 01 01 01 01 02 01 02 05 05 05 03 04 01 02	ERC-10198 LANGLEY-10294 LEWIS-10353 M-FS-13737 M-FS-13749 M-FS-20152 M-FS-20152 M-FS-14309 M-FS-14309 M-FS-14815 M-FS-14815 M-FS-14872 M-FS-20126 KSC-09955 NPD-10783 LANGLEY-10407 MSC-11827 LEWIS-10443 GSFC-10173 LEWIS-10281 LEWIS-10281
B68-10541 B68-10542 B68-10544 B68-10544 B68-10545 B68-10545 B68-10547 B68-10549 B68-10550 B68-10551 B68-10551 B68-10553 B68-10553 B68-10555 B68-10555 B68-10556 B68-10556 B68-10556	01 01 01 01 01 02 05 05 05 05 03 04 01 02	ERC-10198 LANGLEY-10294 LEWIS-10353
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